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of the
American Veterinary Medical Association

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FROM the standpoint of modern medical conventionalities, it is illogical for scientific men to teach technical medicine to the owners of animals; veterinary medicine is not so elementary, nor crude, nor unimportant that college-trained clinicians are not needed by the live stock industry and public health service.

NOR does it seem logical to allocate the delicate problems of preventive medicine to untrained hands, while only the arduous remnants of veterinary practice are left for clinicians furnished by the veterinary colleges. The future usefulness of the veterinary profession appears to lie in a critical study of the present program by all concerned.

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Vol. LXXXVII, N. S. Vol. 40 JULY, 1935 No. 1

PROPOSED AMENDMENTS

At the meeting in Oklahoma City next month, the House of Representatives of the A. V. M. A. will consider a number of amendments to the Constitution and By-Laws, these having been introduced at the meeting in New York, in 1934. Although the proposed changes in themselves appear to be comparatively simple, it has been no easy matter to draft appropriate sections of the Constitution and By-laws to cover the proposed changes. This is true particularly of the changes which may be necessary in the event that it is decided to change the present method of nominating and electing the president of the A. V. M. A.

It has been proposed that the House of Representatives make the nominations for president, instead of the active members present at a general business session, as at present. Then, it has been proposed that the election be held by mail, rather than at the annual meeting, as at present. The third change proposed is that the president be elected one year in advance of the time of taking office. In other words, it is proposed that we elect a president-elect and have a year intervene between the time of his election and when he takes office. In connection with this proposal, it has been suggested that the president-elect, instead of the immediate past-president, be an ex-officio member of the Executive Board.

Another proposed amendment provides for the creation of a new committee to be known as the Committee on Public Rela-

tions. This new committee will not only take over the functions of the Special Committee on Agricultural Extension Service, but will cover a much broader field of activities, such as are suggested in the name of the new committee.

The other question to be decided at Oklahoma City is whether or not the A. V. M. A. will let down the bars to active membership, by admitting persons who are not veterinarians but who are identified with some form of veterinary work and who possess a doctorate in either medicine, science or philosophy.

Instead of presenting at this time a long list of sections of the Constitution and By-laws, with the appropriate changes for putting into effect all of the possible changes that will come up for approval at Oklahoma City, we believe that the issues can be presented much more clearly in the form of questions, any of which may be answered with a "yes" or a "no." At any rate, here they are:

1. Shall the A. V. M. A. elect the president one year in advance of the time that he takes office?
2. Shall the president of the A. V. M. A. be elected by mail ballot?
3. Shall nominations for the office of president be made by the House of Representatives?
4. Shall the A. V. M. A. create a Committee on Public Relations?
5. Shall active membership in the A. V. M. A. be made available to other than graduate veterinarians?

ARKANSAS SIGNS UP

The Arkansas Veterinary Medical Association voted to affiliate with the A. V. M. A., at the annual meeting held June 14, 1935, according to information received from Dr. C. D. Stubbs, State Veterinarian, who was elected to represent the Association in the House of Representatives at the forthcoming meeting in Oklahoma City. Now that Arkansas has affiliated, only one state—Wyoming—remains outside the fold. Advices received from Wyoming are to the effect that veterinarians of that state are in favor of affiliation and will take appropriate action at the next meeting of the Wyoming Veterinary Association. This will leave Idaho without representation, but until the time that the veterinarians of Idaho can get together and reorganize their state association, there is no way open for Idaho to participate in the deliberations of the A. V. M. A. House of Representatives. The

same may be said of Hawaii, where the territorial association has been dormant for some time.

EXECUTIVE BOARD ELECTIONS

The special primary election in Executive Board District 4 (Alabama, Cuba, District of Columbia, Florida, Georgia, Kentucky, Maryland, Mississippi, North Carolina, South America, South Carolina, Tennessee, Virginia, West Indies and West Virginia) came to a close on June 24, and a tabulation of the nominations disclosed the interesting fact that the results were practically the same as in the regular election held a year ago. With the exception of Dr. C. A. Cary, the successful candidate in 1934, whose death on April 23 caused the vacancy which necessitated the special election, all candidates nominated last year were chosen again this year. It would appear that the members of the A. V. M. A. located in District 4 do not change their minds to any extent, when it comes to selecting their candidates for an Executive Board election. Here are brief statements concerning the five nominees.

BARNETTE, W. A. Greenwood, S. C.

Practitioner. Graduate of Ohio State University, 1913. Joined A. V. M. A., 1915. Resident secretary for South Carolina, 1920-1921. Member of Committee on Prevention of Transmissible Diseases of Animals, 1928-1929.

DIMOCK, W. W. Lexington, Ky.

Professor of Veterinary Science, College of Agriculture, University of Kentucky. Graduate of New York State Veterinary College, Cornell University, 1905. Joined A. V. M. A., 1906. Resident secretary for Iowa, 1910-1913. Resident secretary for Kentucky, 1922-1924. Member of Committee on Diseases, 1913-1915. Member of Committee on Abortion, 1923-24. Chairman of Committee on Local Arrangements, 1925-1926. First vice-president, 1926-1927. Member (1929-1931) and chairman (1927-1929 and 1931-1932) of Committee on Prevention of Transmissible Diseases of Animals. Member of Executive Board, 1935—.

KNAPP, J. V. Tallahassee, Fla.

State Veterinarian of Florida. Graduate of Colorado State College, 1911. Joined A. V. M. A., 1926. Resident secretary for Florida, 1931-1933. Secretary of Section on Sanitary Science and Food Hygiene, 1931-1933. Member of Committee on Program, 1931-1933.

LEWIS, W. K. Columbia, S. C.

State Veterinarian of South Carolina. Graduate of the Ontario Veterinary College, 1900, and of the McKillip Veterinary College, 1903. Joined A. V. M. A., 1915. Resident secretary for South Carolina, 1921-1922.

MOORE, WILLIAM — Raleigh, N. C.

State Veterinarian of North Carolina. Graduate of the U. S. College of Veterinary Surgeons, 1911. Joined A. V. M. A., 1926. Resident secretary for North Carolina, 1926-1933. Member of Special Committee on Agricultural Extension Service, 1929-1931. Member of Special Committee on Affiliation of State and Provincial Associations, 1929-1933. Chairman of Committee on Resolutions, 1931-1932. Member of Special Committee on Tuberculosis, 1933—.

DR. C. H. HAYS

DR. H. C. H. KERKAMP

In the regular elections held in Executive Board districts 5 and 7, which came to a close on June 27, one new member of the Board was elected and one present member re-elected. In District 5 (Iowa and Minnesota), Dr. Howard H. C. Kernkamp (O. S. U. '14), of the University of Minnesota, was the winner. The popularity of Dr. Kernkamp is attested by the fact that he received a majority of the votes cast. In District 7 (Alaska, Hawaii, Idaho, Montana, Nebraska, North Dakota, Oregon, Philippine Islands, South Dakota, Washington and Wyoming), Dr. Clark H. Hays (O. S. U. '08), of the U. S. Bureau of Animal Industry, was re-elected. Both will serve five-year terms beginning at the close of the meeting in Oklahoma City next month.

Now Colorado State College

The name of the Colorado Agricultural College has been changed to the Colorado State College of Agriculture and Mechanic Arts. The change was made at the session of the state legislature which ended in April, 1935.

Oklahoma City Hotels

Hotel	Address	Distance from Headquarters (Blocks)	Rooms	Minimum Rates			
				Without Bath		With Bath	
				Single	Double	Single	Double
Skirvin (Official Headquarters)	1st and Broadway	Headquarters	400	.....	.....	$2.50–$3.00–$3.50–$4.00	$3.50–$4.00–$5.00–$6.00; Twin beds, $4.00–$5.00–$6.00
Huckins	Main and Broadway	1	300	$1.50	$2.50	$2.00–$2.50	$3.00–$3.50
Wells-Roberts	15 No. Broadway	1	200	.....	.....	$2.00–$2.50–$3.00	$3.00–$3.50–$4.00
Bristol	300 No. Broadway	1	107	$1.00	$1.50	$1.50–$2.00	$2.50–$3.00
Kinkade	17-19 W. Grand	2½	228	$1.25–$1.50	$2.00–$2.50	$1.75–$2.00–$2.25–$2.50	$2.75–$3.00–$3.25–$3.50–$4.00
Biltmore	Grand and Harvey	4	600	.....	.....	$2.50–$3.00–$3.50–$4.00	$4.00–$5.00–$6.00–$7.00; Suites, $10.00–$20.00
Black	Grand and Hudson	5	200	.....	.....	$2.00–$2.50–$3.00	$3.00–$3.50–$4.00

PROGRAM FOR OKLAHOMA CITY MEETING

MONDAY, AUGUST 26

MORNING ..... Committee meetings.

AFTERNOON ..... Meeting of Executive Board.

TUESDAY, AUGUST 27

MORNING ..... Opening session, 10 a. m., *Skirvin Court.*
Ladies attend.

AFTERNOON ..... Theater party for ladies, 12:45 p. m.
General session, 1:30 p. m., *Skirvin Court.*
Sectional meetings, 2 p. m.
General Practice. Research.
Sanitary Science and Food Hygiene.
Meeting of House of Representatives.
Meeting of American Animal Hospital Association.

EVENING ..... Alumni meetings, 6 p. m., *Chamber of Commerce.*
President's reception and dance, 8 p. m., *Skirvin Court.*
Meeting of Phi Zeta, 8:30 p. m.

WEDNESDAY, AUGUST 28

MORNING ..... General session, 9 a. m., *Skirvin Court.* Papers.
Ladies leave Skirvin Hotel 9:30 a. m., for Nichols Hills Country Club, for bridge and luncheon.
Luncheon, Oklahoma Veterinary Medical Association, 12 noon.

AFTERNOON ..... Sectional meetings, 2 p. m.
General Practice. Small Animals.
Research-Poultry. Military Medicine.
Annual meeting of Women's Auxiliary, 2 p. m., Nichols Hills Country Club.

EVENING ..... General banquet, 7 p. m., *Skirvin Court.*

THURSDAY, AUGUST 29

MORNING ..... Sectional meetings, 9 a. m.
Sanitary Science and Food Hygiene.
Small Animals. Poultry.
Meeting of House of Representatives, 9 a. m.
Shopping tour and treasure hunt for ladies, 9:30 a. m.
Luncheon, Section on Small Animals, 12 noon.

AFTERNOON .....Closing session, 1:30 p. m., *Skirvin Court.*
Trip to Fort Reno, 2:30 p. m. Ladies go.

FRIDAY, AUGUST 30

MORNING .....Clinic, 8 a. m., *Coliseum.*

AFTERNOON .....Clinic continued.
Luncheon and style show for ladies, 1 p. m., *Skirvin Hotel Roof Garden.*

SKIRVIN HOTEL, OKLAHOMA CITY OFFICIAL HEADQUARTERS

APPLICATIONS FOR MEMBERSHIP

Applications for membership continued to come in at an encouraging rate during June. The number, by an odd coincidence, just equaled the number received during May. The number of applications being given first listing this month is the largest for July since 1929. Oklahoma still has a comfortable lead in the race this year, and interest is centered on second place, with Ohio, New York, California and Kansas making strong bids for this honor.

As is customary every six months, we are publishing the section of the By-laws outlining the method of handling applications for membership. Section 1 of Article 2 of the By-laws reads as follows:

> Application for membership shall be made upon a blank furnished by the Association, in the handwriting of the applicant,

and must be endorsed by two members of the Association in good standing, one of whom must be a resident of the state, province or territory in which the applicant resides. Application must be accompanied by the membership fee of $5.00 and dues pro rata for the balance of the fiscal year current, as stated on the application blank. Application must be filed with the Secretary and be examined by him for correctness and completeness as far as available information will allow. After such approval by the Secretary, the latter will cause to be published in the official JOURNAL, as soon thereafter as possible, said application with name and address of applicant, college and year of graduation, and names of vouchers. If no objections shall be filed with the Secretary, as against the applicant being admitted to membership in the Association, his name shall again be listed in the next issue of the JOURNAL, and if no objections shall have been filed within thirty days after the second publication of the name of the applicant, he shall automatically become a member and shall be so enrolled by the Secretary, and membership card issued. If any objections be filed against any applicant, either on first or second notice, said application will be referred to the Executive Board for consideration.

FIRST LISTING

APPLE, HENRY J. 1037 Chambers Rd., Columbus, Ohio.
B. S. A., Ohio State University, 1928
M. S., Ohio State University, 1931
D. V. M., Ohio State University, 1935
Vouchers: W. F. Guard and J. H. Knapp.

BOWMAN, WALTER W. Frederick, Okla.
D. V. M., Kansas City Veterinary College, 1916
Vouchers: C. C. Hisel and L. J. Allen.

CAMERON, BERTRAM N. 62 N. Main St., Middleboro, Mass.
D. V. M., Ohio State University, 1933
Vouchers: W. F. Guard and J. H. Knapp.

CAVANAUGH, JOSEPH L. 334 Federal Bldg., Oklahoma City, Okla.
D. V. M., Kansas State College, 1935
Vouchers: R. R. Dykstra and C. H. Fauks.

CHAMLEY, JOHN A. Artesian, S. Dak.
D. V. M., Saint Joseph Veterinary College, 1921
Vouchers: C. H. Hays and Peter H. Canakis

CHASE, CHARLES H., JR. 218 Bettlewood Ave., Oaklyn, N. J.
V. M. D., University of Pennsylvania, 1933
Vouchers: F. E. Lentz and G. A. Dick.

CLARK, AUGUSTUS B. 334 Federal Bldg., Oklahoma City, Okla.
D. V. M., Alabama Polytechnic Institute, 1934
Vouchers: C. C. Hisel and C. H. Fauks.

CORBIN, BENJAMIN F. Santa Monica, Calif.
D. V. M., Ohio State University, 1935
Vouchers: W. F. Guard and J. H. Knapp.

DAUDEL, FRED A. Kimball, S. Dak.
M. D. C., Chicago Veterinary College, 1906
Vouchers: C. H. Hays and Peter H. Canakis.

EBERT, EDGAR F. 7230 Wornall Rd., Kansas City, Mo.
D. V. M., Colorado State College, 1931
Vouchers: G. G. Graham and S. J. Schilling.

FISHER, GEORGE D. Hope, N. Dak.
V. S., Ontario Veterinary College, 1904
Vouchers: R. E. Shigley and Lee M. Roderick.

FITTE, JOHN M. Box 124, Marlin, Texas
D. V. M., Texas A. and M. College, 1932
Vouchers: T. O. Booth and P. P. Starr.

GEARHART, HENRY E. Kaw City, Okla.
D. V. M., Kansas City Veterinary College, 1918
Vouchers: C. C. Hisel and C. H. Fauks.

HARTWIG, FRED G. 334 Federal Bldg., Oklahoma City, Okla.
D. V. M., Kansas State College, 1916
Vouchers: C. C. Hisel and L. J. Allen.

HAUPERT, CHARLES L. Port Washington, Ohio
D. V. M., Ohio State University, 1935
Vouchers: W. F. Guard and J. H. Knapp.

HENSON, WILLIAM R. R. 2, Elyria, Ohio
D. V. M., Ohio State University, 1933
Vouchers: W. F. Guard and J. H. Knapp.

HINZ, JOHN F. Lidgerwood, N. Dak.
M. D. C., Chicago Veterinary College, 1909
Vouchers: M. C. Hawn and Lee M. Roderick.

HOLEMAN, ROY D. 1509 E. Main St., Enid, Okla.
D. V. M., Kansas City Veterinary College, 1917
Vouchers: C. C. Hisel and C. H. Fauks.

KELSALL, SAMUEL, III 334 Federal Bldg., Oklahoma City, Okla.
D. V. M., Kansas State College, 1935
Vouchers: R. R. Dykstra and C. H. Fauks.

KNAPPENBERGER, JOSEPH F. 334 Federal Bldg., Oklahoma City, Okla.
D. V. M., Kansas State College, 1935
Vouchers: C. C. Hisel and L. J. Allen.

LINZINMEIR, CHARLES B. 115 E. Fifth St., Marysville, Ohio
D. V. M., Ohio State University, 1935
Vouchers: W. F. Guard and J. H. Knapp.

MATHER, GEORGE W. 51 Carver St., Boston, Mass.
D. V. M., Iowa State College, 1935
Vouchers: C. H. Stange and C. D. Lee.

MICUDA, JOHN 235 N. Market St., Frederick, Md.
D. V. M., Ohio State University, 1934
Vouchers: Alexander Gow, Jr., and R. V. Smith.

MORGAN, HARRY B. 2011 W. Broadway, Muskogee, Okla.
D. V. S., Kansas City Veterinary College, 1910
Vouchers: C. H. Fauks and L. J. Allen.

MOSLEY, JOSEPH L. Box 324, Temple, Okla.
D. V. M., Kansas City Veterinary College, 1917
Vouchers: L. J. Allen and Thomas O'Reilly.

MOSLEY, THOMAS Lawton, Okla.
D. V. M., Chicago Veterinary College, 1920
Vouchers: Thomas O'Reilly and C. C. Hisel.

MYERS, IRVIN 1306 Plum St., Ottumwa, Iowa
D. V. M., Ohio State University, 1913
Vouchers: E. S. Dickey and Reuben Hilty.

NORTHWAY, JAMES K. Box 447, Kingsville, Texas.
D. V. M., Kansas City Veterinary College, 1917
Vouchers: Leon G. Cloud and R. P. Marsteller.

PECK, JAMES E. 1210 Macklind, Saint Louis, Mo.
D. V. M., Iowa State College, 1932
Vouchers: Ashe Lockhart and J. C. Flynn.

PRICE, CLAYTON J. Yukon, Okla.
D. V. M., Kansas State College, 1931
Vouchers: C. C. Hisel and L. J. Allen.

ROY, PETER S. Box 543, Sanford, Fla.
D. V. M., Ohio State University, 1935
Vouchers: W. F. Guard and J. H. Knapp.

SMITH, CLAUDE A. R. 3, Fayette, Ohio
D. V. M., Ohio State University, 1935
Vouchers: W. F. Guard and J. H. Knapp.

SMITH, ESMOND V. 320 4th St. N. W., Puyallup, Wash.
B. S., D. V. M., State College of Washington, 1935
Vouchers: C. E. Sawyer and C. M. Hamilton.

WARD, JENNINGS L. 435 E. 5th Ave., Lancaster, Ohio
D. V. M., Ohio State University, 1935
Vouchers: W. F. Guard and J. H. Knapp.

Applications Pending

SECOND LISTING

(See June, 1935, JOURNAL)

Beaudette, Fred R., N. J. Agr. Exp. Sta., New Brunswick, N. J.
Bridges, Buford F., 334 Federal Bldg., Oklahoma City, Okla.
Brunke, Allen V., 334 Federal Bldg., Oklahoma City, Okla.
Clavell, Cesar, Box 486, Ponce, Puerto Rico.
Cook, Victor J., 334 Federal Bldg., Oklahoma City, Okla.
Corcoran, James B., 334 Federal Bldg., Oklahoma City, Okla.
Cunningham, George A., 319 F Ave., Lawton, Okla.
Curry, Ray, 334 Federal Bldg., Oklahoma City, Okla.
Davis, Ennis A., 1006 13th St., Columbus, Ga.
Davis, Mack B., 116 N. Harrison St., Shawnee, Okla.
Hatcher, William L., Cimarron, N. M.
Heath, McKenzie, 1520 2nd Ave. North, Birmingham, Ala.
Herbott, Walter K., Admiral Apts., 48th and Locust Sts., Philadelphia, Pa.
Hoffman, Henry A., R. 1, Box 326, Petaluma, Calif.
Holliday, James M., Blackwell, Okla.
Hurd, John M., 334 Federal Bldg., Oklahoma City, Okla.
Ketcham, Harold F., Box 537, Pawhuska, Okla.
Lunstra, Mitchell, 334 Federal Bldg., Oklahoma City, Okla.
McCoy, Frank, Manchester, Okla.
Magatagan, Vernon H., Apt. 4, Plunkett, Albuquerque, N. M.
Maginnis, Ernest V., Kingfisher, Okla.
Maxey, Howard C., 334 Federal Bldg., Oklahoma City, Okla.
Metcalfe, Elmer L., 334 Federal Bldg., Oklahoma City, Okla.
Moore, Robert G., Dunlap, Iowa.
Netherton, C. O., 334 Federal Bldg., Oklahoma City, Okla.
Plummer, Wilbert A., Laverne, Okla.
Sirilo, Lt. Andrew J., Fort Sill, Okla.
Slankard, Jesse J., Elk City, Okla.
Storz, Fred, 3200 Muncie Blvd., Kansas City, Kan.
Taylor, Lt. Clarence L., Fort Hoyle, Md.
Watson, Maj. Harry L., Fort Sill, Okla.
Whitcomb, Russell E., 52 Miller St., Belfast, Me.
Worsham, Ivel C., Bixby, Okla.
Wright, Benjamin W., 334 Federal Bldg., Oklahoma City, Okla.

The amount which should accompany an application filed this month is $7.50 which covers membership fee and dues to January 1, 1936, including subscription to the JOURNAL.

COMING VETERINARY MEETINGS

Ak-Sar-Ben Veterinary Medical Association. Elks Building, Omaha, Nebr. July 8, 1935. Dr. J. N. McIlnay, Secretary, 3251 Leavenworth St., Omaha, Nebr.

Northwest Veterinary Medical Association. (Joint meeting of the Oregon, Washington and British Columbia Veterinary Medical Associations.) Victoria, B. C. July 8-10, 1935. Dr. W. Graham Gillam, Secretary, Cloverdale, B. C.

San Diego County Veterinary Medical Association. San Diego, Calif. July 9, 1935. Dr. L. K. Knighton, Secretary, 3438 Mountain View, San Diego, Calif.

Wisconsin Veterinary Medical Association. Chula Vista Resort, Wisconsin Dells, Wis. July 9-10, 1935. Dr. B. A. Beach, Secretary, University of Wisconsin, Madison, Wis.

Maine Veterinary Medical Association. Bar Harbor, Maine. July 10, 1935. Dr. R. E. Libby, Secretary, Richmond, Maine.

Kentucky Veterinary Medical Association. Brown Hotel, Louisville, Ky. July 10-11, 1935. Dr. E. A. Caslick, Secretary, Paris, Ky.

Virginia State Veterinary Medical Association. (Joint meeting with the District of Columbia, Maryland, North Carolina and West Virginia Veterinary Medical Associations.) Jefferson Hotel, Richmond, Va. July 10-12, 1935. Dr. I. D. Wilson, Secretary, Virginia Polytechnic Institute, Blacksburg, Va.

Houston Veterinary Association. Houston, Texas. July 11, 1935. Dr. T. A. Ward, Secretary, 2515 Ralph St., Houston, Texas.

Tulsa County Veterinary Association. Tulsa, Okla. July 11, 1935. Dr. J. M. Higgins, Secretary, 3305 E. 11th St., Tulsa, Okla.

Minnesota State Veterinary Medical Society and University of Minnesota Short Course for Veterinarians. University Farm, Saint Paul, Minn. July 11-12, 1935. Dr. C. P. Fitch, Secretary, University Farm, Saint Paul, Minn.

New Jersey, Veterinary Medical Association of. Hotel Claridge, Atlantic City, N. J. July 11-12, 1935. Dr. John C. Hardenbergh, Secretary, c/o Walker-Gordon Lab. Co., Plainsboro, N. J.

Vermont Veterinary Medical Association. Hotel Coolidge, White River Junction, Vt. July 12-13, 1935. Dr. G. N. Welch, Secretary, 43 Union St., Northfield, Vt.

Missouri Veterinary Medical Association. Chamber of Commerce Bldg., Saint Joseph, Mo. July 16-17, 1935. Dr. Ashe Lockhart, Secretary, 800 Woodswether Rd., Kansas City, Mo.

South Carolina Association of Veterinarians. Claremont Hotel, Sumter, S. C. July 16-17, 1935. Dr. G. J. Lawhon, Secretary, Hartsville, S. C.

Southern California Veterinary Medical Association. Chamber of Commerce Bldg., Los Angeles, Calif. July 17, 1935. Dr. T. G. Beard, Secretary, 3684 Beverly Bldg., Los Angeles, Calif.

Western Michigan Veterinary Medical Association. Ionia Fair Grounds, Ionia, Mich. July 25, 1935. Dr. C. H. Haasjes, Secretary, 728 S. State St., Shelby, Mich.

Michigan State Veterinary Medical Association. Blaney Park, Blaney, Mich. August 1-2, 1935. Dr. E. K. Sales, Secretary, 535 Forest St., East Lansing, Mich.

Poultry Science Association. University of New Hampshire, Durham, N. H. August 6-9, 1935. Prof. T. B. Charles, President.

American Animal Hospital Association. Skirvin Hotel, Oklahoma City, Okla. August 27, 1935. Dr. D. A. Eastman, Secretary, 901-19th St., Moline, Ill.

American Veterinary Medical Association. Skirvin Hotel, Oklahoma City, Okla. August 27-30, 1935. Dr. H. Preston Hoskins, 221 N. La Salle St., Chicago, Ill.

STATE BOARD EXAMINATIONS

Vermont Board of Veterinary Registration and Examination. State House, Montpelier, Vt. July 2-3, 1935. The examination will be started at 1 p. m., on the first day and at 8 a. m. on the second day. Dr. George Stephens, President-Secretary, White River Junction, Vt.

Massachusetts Board of Registration in Veterinary Medicine. Department of Civil Service and Registration, Boston, Mass. July 9-10, 1935. Applications may be obtained from the Secretary. Dr. E. W. Babson, Secretary, Gloucester, Mass.

Illinois State Board of Veterinary Examiners. Chicago, Ill. July 11-12, 1935. Dr. L. A. Merillat, president of the Examining Committee, asks candidates to file their applications with the Director of Registration and Education, Springfield, Ill., who will notify them of the hour and place of examination.

THE TOXICITY OF GLOTTIDIUM VESICARIUM (JACQ.) HARPER SEEDS FOR THE FOWL*

By M. W. EMMEL, *Gainesville, Fla.*
Agricultural Experiment Station

Seeds of *Glottidium vesicarium* (Jacq.) Harper were brought to our laboratory with the request that a determination be made of their toxicity for the chicken. *G. vesicarium* is a common plant in Florida and birds running at large may come in contact with large numbers of the seed. Foote[1] found 14 grams of the crushed seeds of *G. vesicarium* to be toxic for the cat and indicated the toxic principal to be a saponin. Accordingly, experiments were conducted to determine whether the seeds of this plant are toxic for chickens.

DESCRIPTION OF GLOTTIDIUM VESICARIUM (JACQ.) HARPER†

Glottidium vesicarium (Jacq.) Harper: Plant annual but somewhat woody, 1 to 3 m tall, sometimes widely branched, often growing in large colonies in damp soil. Leaves, alternate pinnate, with 20 to 52 leaflets; leaflets elliptic, mucronate, 1.5 to 4 cm long, dark green above, paler beneath. Flowers, one to several in axillary peduncles, 2 cm or more long; corolla, yellow (or dark reddish purple in variety atrorubrum), about 1 cm across; standard reniform, rounded; wings and keel angular; stamens 10, diadelphous, 0 and 1. Calyx 5-lobed, the lobes much shorter than the tube. Pods pendant, usually in pairs, ellipsoid, acuminate at both ends, 5 to 8 cm long; outer wall dehiscent, inner wall remaining as a white papery envelope. Seeds 2, gray brown, mottled. Flowers in summer and fall. Pods often remain on dead stalks all winter. Coastal plain, North Carolina to Florida and Texas. Introduced from West Indies.

EXPERIMENTAL DATA

Four adult Single Comb White Leghorn hens were fed 200 seeds of *G. vesicarium*, 100 seeds on November 1 and 100 seeds on November 3, 1933. As this number of seeds proved toxic for the chickens to which they were fed, 12 more Single Comb White Leghorn hens were fed varying numbers of seeds as indicated in table I. This table also contains total and differential blood-counts and the hemoglobin readings (Sahli) of all experiment birds.

*Received for publication, February 18, 1935.

†By Erdman West, mycologist of the Florida Agricultural Experiment Station.

Clinical symptoms: In the acute type of poisoning, the bird became prostrate, the comb was dark and congested and a yellowish diarrhea was often present. In the subacute or subchronic stage, the comb was often congested and dark; the feathers became rough and occasionally considerable emaciation occurred.

FIG. 1. The beans and open pods of *Glottidium vesicarium* (coffee bean weed). Note the inner membrane enclosing the two seeds which are found in almost every pod (approximately normal size).

Chronic cases presented a picture of emaciation although some birds remained in fair flesh; the comb became light and scaly; the feathers were rough or ruffled, a copious yellow diarrhea, the solid portion of the feces being green, was usually observed.

Gross pathology: In acute types of poisoning, the subcutaneous and body fat was often dirty yellow in color. Occasionally the subcutaneous tissue was edematous. The muscles were often

TABLE I—*Total and differential blood-counts of experiment birds affected with Glottidium vesicarium poisoning.*

Bird	Seeds Fed	Date	Autopsy	Blood Count	Erythrocytes (1,000)	Leukocytes	Hemoglobin (Sahli)	Polymorphonuclears	Lymphocytes				Basophiles	Monocytes	Polychrome Erythrocytes	Basophile Erythrocytes
									Mature	Vacuolar	Immature	Degenerative				
453	100	11–1		11–1	3,250	33,000	56	45	48	4	1	0	0	2		
	100	11–3	11–8	11–8	3,170	30,000	54	40	47	8	0	0	2	3		
403	100	11–1		11–1	2,970	34,000	54	27	62	6	0	0	3	2		
	100	11–3	11–5	11–5	3,120	32,000	55	36	53	8	0	0	1	2		
429	100	11–1		11–1	3,500	28,000	57	40	53	3	1	0	2	1		
	100	11–3	11–6	11–6	3,100	29,000	53	42	46	9	0	0	0	3		
440	100	11–1		11–1	3,000	36,000	54	32	59	5	0	0	2	2		
	100	11–3	11–6	11–6	2,970	32,000	54	25	60	10	0	0	3	2		
420*	100	11–18		11–18	3,350	32,000	54	31	66	0	0	0	3	0		
			12–11	12–11	3,070	25,000	57	14	54	20	4	0	0	8		++
439*	100	11–18		11–18	3,260	30,000	51	37	57	2	1	0	2	1		
			12–15	12–15	3,190	26,000	55	29	64	4	0	0	0	3		+
93.7	5 daily	11–18		11–18	3,210	29,000	55	32	62	3	0	0	0	3		
			12–27	12–27	2,740	20,000	52	49	14	28	0	0	3	6		+
414	5 daily	11–18		11–18	3,500	30,000	53	32	55	8	0	0	3	2		
			12–8	12–8	3,000	17,500	50	34	44	9	6	0	0	7		++
403	10 daily	11–18		11–18	2,980	32,000	51	48	44	4	0	0	2	2		
			1–9	1–9	2,970	17,500	47	40	24	24	0	0	4	8	++	−

TABLE I—*Total and differential blood-counts of experiment birds affected with Glottidium vesicarium poisoning—Concluded.*

BIRD	SEEDS FED	DATE	AUTOPSY	BLOOD COUNT	ERYTHROCYTES (1,000)	LEUKOCYTES	HEMOGLOBIN (SAHLI)	POLYMORPHONUCLEARS	LYMPHOCYTES				BASOPHILES	MONOCYTES	POLYCHROME ERYTHROCYTES	BASOPHILE ERYTHROCYTES
									MATURE	VACUOLAR	IMMATURE	DEGENERATIVE				
445	10 daily	11–18		11–18	2,770	29,000	52	38	59	3	0	0	0	0		
			11–27	11–27	2,870	22,000	51	30	28	33	2	0	1	6		
465	10 daily	1–13		1–13	3,170	34,000	49	32	50	13	1	0	2	2		
			2–14	2–14	2,830	20,000	45	12	30	45	0	0	0	13	+	
86.7	10 daily	1–13		1–13	3,320	32,500	50	44	42	9	0	0	3	2		
			2–12	2–12	2,550	23,000	51	34	20	34	0	2	0	10		
460	20 daily	1–13		1–13	3,310	31,000	55	26	60	11	0	0	2	1	4	
			2–14	2–14	3,050	21,000	50	25	9	54	0	2	0	6	(myelo-	
427	20 daily	1–13		1–13	3,000	33,000	48	42	43	12	0	0	1	2	cytes)	
			2–12	2–12	2,320	25,000	43	26	25	38	0	1	0	10	+	+
466	150	1–13		1–13	3,010	36,000	50	36	57	5	1	0	1	0		
			1–23	1–23	2,970	21,000	46	25	35	26	4	4	0	6		
100-1	150	1–13		1–13	3,220	36,000	52	40	48	8	0	0	2	2		
			2–7	2–7	2,980	21,500	53	33	24	28	8	0	0	7	+	+
450	Control			11–18	3,500	32,000	55	42	51	4	0	0	2	1		
			2–16	2–16	3,240	34,000	57	38	51	8	0	0	2	1		
92-8	Control			11–18	2,980	36,000	56	29	61	7	0	0	1	2		
			2–16	2–16	3,120	30,000	55	32	54	12	0	0	0	2		

•Birds 420 and 439 showed clinical symptoms but probably would have survived.

dark. The crop and gizzard were usually full of feed and contained many seeds of *G. vesicarium*. The mucous membrane of the crop was often slightly necrotic and portions of the gizzard, particularly the bulbous portions where the muscle wall is thin, showed the same lesion. In these latter areas the mucous membrane peeled with ease and was apparently partially separated from the underlying tissue. The small intestine, particularly the duodenum, showed slight catarrhal or necrotic inflammation. A few petechiae were sometimes found in the mesentery and gizzard fat. The liver was often dark and congested, but at times pale and rather friable, and occasionally showed a few petechiae or foci of necrosis. The most consistent and marked lesion in the chronic type of poisoning was the presence of necrotic enteritis, particularly in the duodenum. The first ten or twelve inches of the small intestine was most severely affected, the enteritis rapidly diminishing posterior to this point. The serosa of this affected portion of the small intestine was usually gray in color and apparently thickened. The blood-vessels of the remaining portion of the small intestine were usually congested.

The mucous membrane of the crop was usually necrotic. Even though some birds were starved overnight their crops were full the following morning. It was common to find seeds of *G. vesicarium* in the crop at autopsy even though the bird had not eaten them for some time. This was attributed to a decreased activity of the movements of the digestive tract.

Portions of the lining membrane of the gizzard showed necrosis, although this was not so common as in the acute type of poisoning. There were instances, however, of edema of the submucosa and occasional small foci of necrosis in the underlying tissue. The gizzard was commonly full of feed with the contents often discolored with bile. What appeared to be a dekeratinization of the membrane lining the gizzard occurred rather frequently, particularly in that portion of the gizzard nearest the proventriculus. The inner lining of the gizzard was usually discolored by bile.

The proventriculus failed to show constant lesions; in one bird there were small ecchymoses between the gland orifices and in another the craters of the orifices were hemorrhagic. Atrophy of the spleen was commonly present, this organ in many cases being only one-third of its normal size. The heart was invariably soft, flaccid, and slightly atrophied. Occasionally the pericardium was cloudy and slightly thickened.

The liver presented a rather variable picture. There was very little change in size, although this organ was often slightly en-

larged. The organ was usually pale and the surface showed few ecchymoses or petechiae but more often the surface showed scattered, blister-like, gray foci. Occasionally the liver was dark and congested or presented a mottled appearance. The gall-bladder was usually enlarged. The kidneys were often congested and somewhat enlarged. The subcutaneous tissue occasionally was edematous. The subcutaneous fat and often the body fat presented a dirty-yellow appearance. Occasionally a few hemorrhages were found in the abdominal fat. The voluntary muscles were often dark in color.

Histopathology: The spleen usually showed various degrees of congestion. The musculature of the splenic arteries was in a state of cloudy swelling. In most instances numerous perivascular foci of proliferation of connective tissue were present, these lesions being more numerous nearer the capsule of the organ. The capsule often showed considerable edema, foci of proliferation of the tunica serosa occasionally taking place, while the smooth muscle fibers invariably showed cloudy swelling. Slight cloudy swelling was usually present in the myocardium and musculature of the coronary arteries. A few areas of congestion and edema, usually not extensive, occurred.

Necrosis of the surface epithelium of the affected portion of the duodenum, particularly at the tips of the villi, generally occurred. The remaining surface epithelium as well as the glandular epithelium showed cloudy swelling. Slight congestion and edema often occurred in the villi. Numerous accumulations of histiocytes usually were observed at the base of the mucous membrane; these foci often caused an obliteration of the villi and glandular tissue. Several such areas contained an occasional focus of proliferation of connective tissue. The muscle coat of the intestines was irregularly thickened and usually showed well advanced cloudy swelling. Many cells were practically devoid of cytoplasm; slight edema was present. The serosa was thickened and edematous.

The surface epithelium of the proventriculus showed much necrosis; those cells which were not in a state of necrosis were in varying states of cloudy swelling. Edema was often present in the stroma of the mucous membrane and the stroma cells often showed cloudy swelling. Foci of histiocytes frequently were observed at the base of the mucous membrane. In such foci one bird showed considerable proliferation of connective tissue. The epithelium of the glandular tissue and collecting ducts was in a state of cloudy swelling. A few areas of congestion and edema often were observed in the glandular structure. Slight cloudy swelling was present in the longitudinal musculature while this

type of degeneration was well advanced in the circular coat of muscle. Muscle cells of the circular coat of the organ often were almost devoid of cytoplasm. The serosa was thickened and edematous. The musculature of the larger arteries in particular showed cloudy swelling with many cells practically devoid of cytoplasm.

The parenchymatous cells of the pancreas, the cells of the isles of Langerhans, the epithelium lining the collecting ducts, and the muscle cells of the pancreatic arteries showed cloudy swelling. The lumina of the collecting ducts usually were filled with considerable tissue débris.

Necrosis of the surface epithelium of the bulbous portion of the gizzard frequently occurred. In other instances cloudy swelling of the epithelium was present. Subepithelial edema was often observed. The muscle fibers showed slight cloudy swelling. As a general rule the muscle cells of the larger arteries were in a state of cloudy swelling. Perivascular edema was often present.

The surface epithelium of the crop was in a state of cloudy swelling; in many instances the surface cells were swollen but practically devoid of cytoplasm. Smooth muscle fibers in the wall also showed cloudy swelling. Considerable congestion often occurred in the subepithelial tissue.

The alveolar walls of the lungs were generally thickened by congestion and occasionally in localized areas by considerable edema. A few areas of compensatory emphysema occurred in the least affected areas. In most instances the epithelium lining the alveoli showed more or less cloudy swelling. A few interlobular hemorrhages occurred. The muscle cells of the walls of the blood-vessels showed cloudy swelling; in the larger vessels many muscle cells were almost devoid of cytoplasm and in most instances such vessels showed subendothelial edema. The epithelium of the bronchioles and bronchi was in a state of cloudy swelling; the stroma submucosa was often slightly edematous and often contained loosely arranged foci of histiocytes.

Many of the glomeruli were enlarged, this condition being brought about chiefly by a proliferation of histiocytes within the tuft. This proliferation was most pronounced at the base from which it often extended into the adjacent tissue. Many of the glomeruli showed considerable degeneration, chiefly at the periphery of the tuft. The epithelium usually showed cloudy swelling. Congestion and edema frequently were observed.

In one bird a few convoluted tubules were greatly distended by accumulations of histiocytes; in all probability they originated at the glomeruli from which they gained access into the tubules

through areas in which degeneration of the epithelium had taken place. The epithelium of the larger collecting ducts was in a state of advanced cloudy swelling. The tissue surrounding such ducts showed some edema and foci of loosely arranged histiocytes. Cloudy swelling of the muscle coat of the arteries was commonly present.

Cloudy swelling was generally present throughout the tubular epithelium of the kidneys. The lumen of the tubules often contained considerable débris. Necrosis occurred, frequently involving individual cells or all the cells of one tubule or groups of tubules. Many cells were practically devoid of cytoplasm. Scattered areas of congestion occurred throughout the cortex. Slight intertubular edema and few small intertubular foci of histiocytes were present.

Fatty degeneration of the hepatic cells was the predominating lesion in the liver. This type of degeneration was general, but foci often occurred in which the degeneration was more intense. In some instances many hepatic cells also showed cloudy swelling, particularly in cases in which fatty degeneration was not extensive. Small perivascular foci of histiocytes usually occurred; some of the foci often showed proliferation. A few larger foci of histiocytes were observed occasionally in the interlobular and intralobular tissue. The epithelium of the bile-ducts as well as the musculature of the larger blood-vessels showed considerable cloudy swelling.

Blood-picture: Birds affected with the chronic type of poisoning usually showed a reduction in the total number of leukocytes as compared with control birds. The number of leukocytes in two birds was 17,500 per cubic mm. There seemed to be a slight tendency for the hemoglobin readings and the number of erythrocytes to decrease in chronic cases although this tendency was not at all marked. Ten birds showed an increase in the number of monocytes present in the blood-steam. There was often a decrease in the number of mature lymphocytes, which usually was compensated for by an increase in the number of vacuolar lymphocytes. Four myelocytes were found in the blood-stream of one bird. Frequently polychrome and basophilic erythrocytes were present.

Controls: Two Single Comb White Leghorn control birds failed to show any of the lesions shown by birds exposed to *G. vesicarium* seeds.

Field Cases

Since the completion of this study, two cases of natural *G. vesicarium* poisoning in two Single Comb White Leghorn adult hens

have been presented at our laboratory for diagnosis. These birds showed symptoms and postmortem lesions similar to our acute experimental cases of *G. vesicarium* poisoning. Seeds were found in the crop and gizzard of each bird. These birds were from a flock of 20 chickens confined in an acre enclosure. Many of the pods of the plant had broken resulting in the seeds being numerous on the ground. The birds were well fed, which would indicate that under some conditions birds will voluntarily eat sufficient seed to induce poisoning.

Discussion

The smallest number of seeds of *G. vesicarium* required to produce death experimentally in adult birds was 150. Two birds fed 100 seeds showed symptoms of poisoning but did not die. However, they were killed for pathological examination.

During the course of these experiments, well-fed adult birds were given free access to the seeds of *G. vesicarium*. Such birds failed to eat the seeds. Semi-starved adult birds given free access to the seeds consumed some seeds but not enough to cause symptoms of poisoning.

The blood-picture of the experiment birds would seem to indicate that there was a destruction of both erythrocytes and leukocytes; the former was indicated by the presence of an increased number of vacuolar lymphocytes, polychrome and basophilic erythrocytes, while the latter was indicated by a considerable reduction in the total number of leukocytes, the presence of an increased number of monocytes and the presence of four myelocytes in one bird.

Summary

One hundred and fifty seeds of *Glottidium vesicarium* (Jacq.) Harper force-fed in a single dose proved fatal for adult Single Comb White Leghorn chickens. Well-fed birds refused to eat the seed voluntarily; semi-starved birds ate some seed but not enough to prove fatal. The most consistent macroscopic lesions were necrotic enteritis and necrosis of the lining of the bulbous portion of the gizzard. Microscopically the hepatic cells showed fatty degeneration; the remaining parenchymatous organs and all involuntary muscle studied were in a state of cloudy swelling; proliferation of histiocytes took place within the glomeruli. Two cases of natural poisoning by the seeds of *G. vesicarium* have been observed. These birds presented lesions typical of our experimental acute cases of poisoning.

Reference

[1]Foote, P. A.: Unpublished data.

AVITAMINOSIS A IN SWINE*

By CECIL ELDER, *Columbia, Mo.*
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During the last few years, we have had occasion to see and study several field cases in swine which showed a very interesting syndrome of symptoms. Although the history did not appear to warrant such a diagnosis, we concluded that we were dealing with a vitamin-A deficiency and, in the fall of 1933, started some experimental work to verify that diagnosis. These experiments were continued through 1934. This paper will deal with those experiments in addition to making a report of the observations made on the several field cases included in our study. In this connection it is interesting to note that during the winters of 1933-34 and 1934-35, especially the latter, more cases of this kind than ever before have been observed by veterinarians in their general practice, and one cannot help but associate this finding with the shortage of feed we now have following the severe drouth of last year.

The following is a description of the conditions as we first found them on the farm where there were several cases of the trouble. We were called to see these pigs in October, 1933, and found several animals affected with the following symptoms: The most outstanding symptom was an incoördination affecting chiefly the hind legs, but in some cases the fore limbs also were involved. There was a peculiar jerking movement, the animals walking with a "stringhalt" action, raising the hind feet high and well forward (fig. 1†). Sometimes they would kick backwards or quickly carry the foot laterally across the other leg. Several of the animals knuckled over while walking. In the more severe cases there were spasms of the legs and the animals had difficulty in walking or running. They sometimes fell to the ground and were unable to get up or got to their feet with great difficulty. All of the animals were conscious but highly nervous. There was no rise in temperature and the appetite remained good in almost every case. When symptoms became very severe, the animals were unable to get to their feet and exhibited symptoms of the so-called posterior paralysis. The entire herd was in good flesh and it appeared that they had made a good growth. The symptoms observed were almost identical with those described by Biester and Murray[1] in 1933.

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†All figures appearing in this article are enlargements from motion-picture film, which accounts for the fact that they are not clear.

Since a complete history of the herd in which this trouble developed was available and also was quite interesting in connection with our diagnosis, a part of it is included here. The animals affected were in a group of pigs which had just come off of a weanling-pig experiment. These pigs were farrowed in the spring of 1933. A part of them had been kept on concrete all the time since they were farrowed, while a lesser number was kept on concrete until they reached the age of six weeks. The latter pigs then had access to pasture for two weeks, but were on concrete for the balancce of the period.

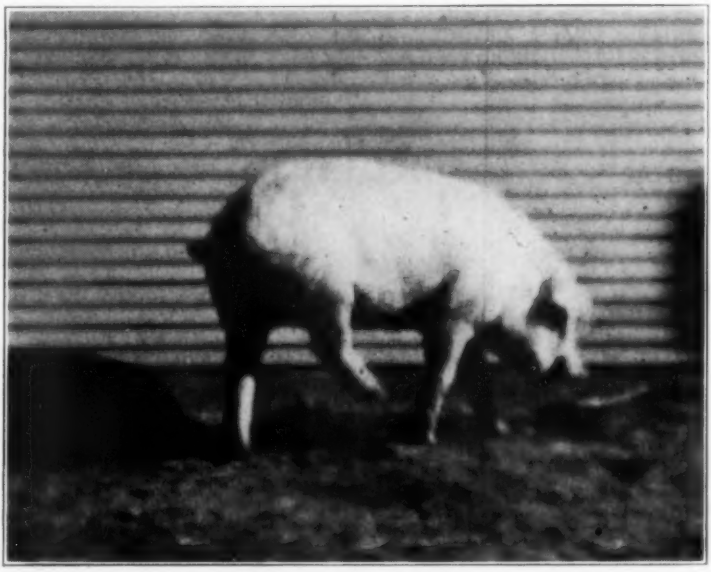

FIG. 1. Field case of avitaminosis A. Both hind legs were affected to the same degree.

On August 1, these animals were placed on experiment, at that time averaging between 49 and 50 pounds in weight. They were fed on the experiment until the 80 head had reached an average weight of 115 pounds. Just as the experiment was closing, a Poland-China pig and a Duroc pig come down with symptoms which I have already described, a condition which we diagnosed as a vitamin-A deficiency. These animals had been receiving the following ration: corn, mostly yellow, self-fed; mineral mixture of equal parts of precipitated calcium phosphate, bone-meal and salt, self-fed. This was supplemented with a mixture which

consisted of tankage, 3 parts; linseed oil meal, 1 part; alfalfa meal, 1 part. All of the pigs on experiment received this supplement. In addition, the animals received in some cases dried skim milk; in other cases liver meal or fish meal, or combinations of these substances.

It would appear that this ration contained a sufficient quantity of vitamin A, yet during the year 1933 several cases resembling vitamin-A deficiency developed in these animals. This same ration had been fed for three years and no trouble was observed in either of the two preceding years. I should like also to call attention to the fact that the feeding experiment was repeated a fourth time in 1934, and no trouble whatsoever developed during that year.

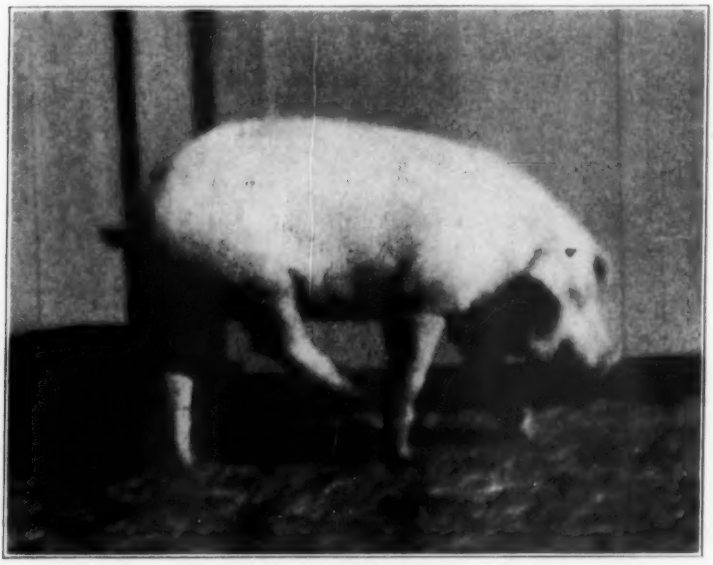

FIG. 2. Field case of avitaminosis A. Same animal as shown in figure 1.

After closing the experiment in 1933, the pigs, along with another group of pigs from the same original source, which had been kept on concrete continuously and fed a good ration, were put together. They had access to a good ration containing yellow corn, etc. Within the period of a very few days, several animals came down with symptoms of avitaminosis A or vitamin-A deficiency—more than 10 per cent of the 150 pigs being affected—some only slightly. Others were markedly or severely affected.

It appeared from a study of the ration that these animals had been receiving a sufficient quantity of vitamin A, and naturally there was some question in our minds regarding the diagnosis which we had made. We therefore started out to verify that diagnosis. Twenty-five pigs, weighing on an average of 140 pounds, were chosen for the experiment; 15 of these showed symptoms of incoördination and ten were entirely normal insofar as we could determine from several different observations. They were divided into five different lots of five animals each, each lot consisting of one severely affected, two mildly affected and two normal animals. The entire group was self-fed a mineral mixture consisting of equal parts precipitated calcium carbonate, bone-meal and salt. They had free access to direct sunshine whenever it was available. The rations in the five lots were as follows:

Lot I. Ground white corn 5 parts } Basal ration
Tankage 1 } 1 part }
Dried skim milk 1 }
Lot II. Basal ration plus pasture.
Lot III. Basal ration plus alfalfa hay.
Lot IV. Basal ration plus 1% cod-liver oil.
Lot V. Ground white corn 8 parts
Tankage 1 } 1 part
Dried skim milk 1 }
Wheat germ 1 part

The animals on experiment all did well and made rapid gains, being sold for slaughter when they reached an average weight of 275 pounds. We attempted, during this period, to study the effects of the different rations on the symptoms observed in the animals at the time they were placed on the experiment.

Lot II, which received a basal ration plus pasture, made a complete recovery. The animals in all of the other lots showed no noticeable change, while the animals on the basal ration alone did not develop the trouble. We attributed this to the fact that the animals had not been kept on this basal ration or a vitamin-A deficient ration long enough to develop symptoms. We were still of the opinion that we were dealing with a vitamin-A deficiency, although it might be stated that we have some evidence to lead us to believe that there may have been another factor entering into these cases.

In further support of our diagnosis, some of the pigs showing marked symptoms were killed and autopsied. No gross lesions were found in any part of the carcass. Sections of spinal cord

and sciatic nerve, imbedded by the Marchi technic, showed unmistakable evidences of fatty degeneration or myelin degeneration. Normal pigs killed at the same time, from the same group of hogs, showed no nerve degeneration changes.

At the end of the experiment, the animals were slaughtered and carefully examined, sections of nerve and spinal cord being imbedded by the same technic. At this time there was no noticeable degeneration in any of the tissues examined, which can probably be accounted for by the fact that considerable time had elapsed between the date when they showed the first symptoms and the date when they were killed.

It is important to note that these animals developed symptoms of avitaminosis A on a ration which was considered adequate and that best results were obtained in bringing about recovery from these symptoms when good bluegrass pasture was added to the ration. We are unable to account for the reason why the animals receiving cod-liver oil, even though it was tested for vitamin A content, did not make a more marked improvement.

On June 30, 1934, we took 30 shoats that had been vaccinated, put them in small pens and fed them a known vitamin-A-deficient ration. This ration was the same as the basal ration already described, consisting of ground white corn, tankage and dried skim milk. These animals were kept on concrete, allowed plenty of sunshine, and were self-fed the mineral mixture already described. Between September 24 and October 3, 1934, the entire lot of pigs took a decided turn for the worse, exhibiting the following symptoms: diarrhea, emaciation, muscular incoördination, blindness, dermatitis, itching, and a very marked pink color of the skin. We were using Chester White hogs and this pink color was very noticeable. In the main, the appetites of all these animals remained good. Examination of the blind hogs was made but no macroscopic lesions in the eye were observed; the only noticeable change was a dilated pupil and possibly some swelling of the eyelids.

By October 19, seven pigs had died on experiment or had been killed because they were down and unable to get to their feet. Of the 23 remaining, nine were badly affected and these were removed, leaving twelve on basal ration. The nine that were removed were divided into three lots of three pigs each and continued on the basal ration. In addition to this, one lot received green feed in the form of Sudan grass, cut and fed fresh, daily; the second lot received cod-liver oil (1 per cent of the ration) and the third well-cured alfalfa hay. In seven to ten days following this change in ration, the pigs in all three pens showed noticeable

improvement; in fact very marked improvement was observed, particularly in the gait, in their ability to see, in their appetite and general condition. The animals left on the basal ration continued to get gradually worse. As soon as their symptoms became very severe, the animals on the basal ration were changed to one of the three above-mentioned lots, and in all cases soon thereafter showed improvement. It was our opinion that the animals in the pen receiving 1 per cent cod-liver oil made the most rapid recovery. Good results, however, were obtained also in the lots receiving cut green feed or well-cured alfalfa hay which had a good green color.

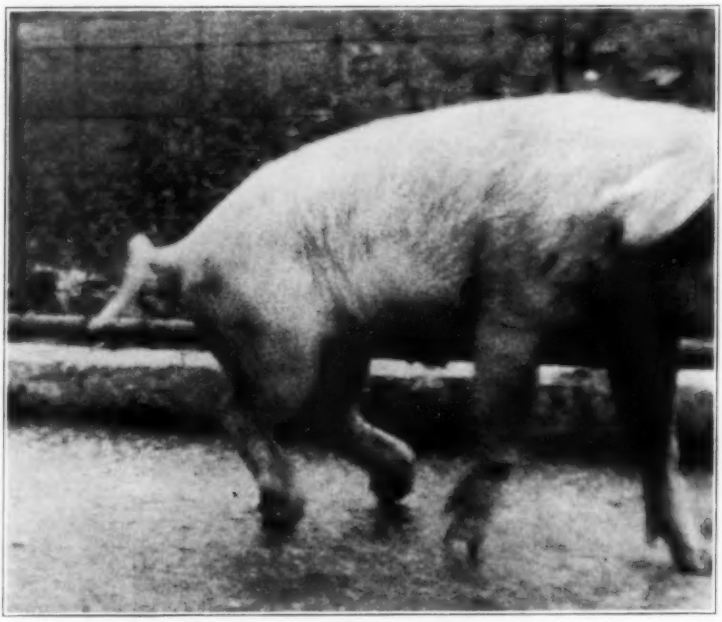

FIG. 3. Experimental case of avitaminosis A. This pig had great difficulty walking.

The symptoms described here are those which were developed in animals fed on a known vitamin-A deficient ration. All degrees of severity of symptoms were noticed but death in most cases was not sudden. One case in particular is interesting because it was the exception. It would have been difficult to make a diagnosis upon this individual had not one been familiar with the history, the rations fed and the way these animals had been handled. This particular animal was a large Chester White

barrow, in excellent condition, weighing from 140 to 150 pounds. One afternoon, while we were working with the pigs on the experiment, we had observed this animal and picked him out as apparently normal.

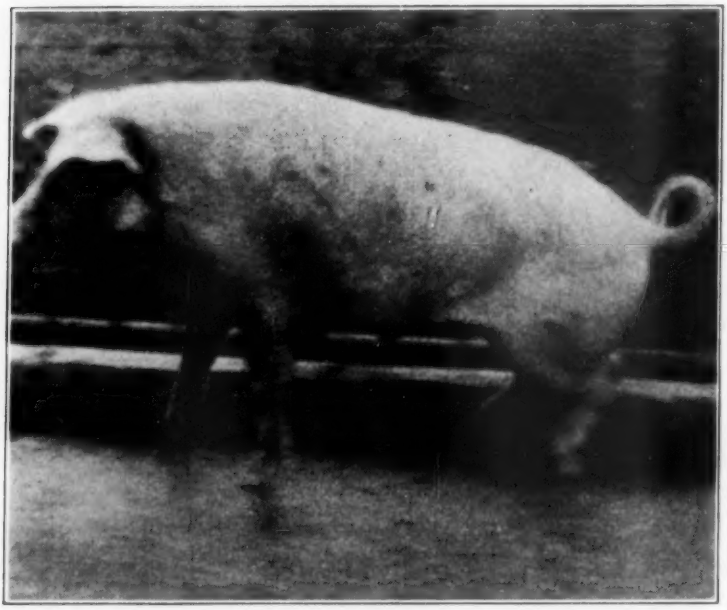

FIG. 4. Experimental case of avitaminosis A. This animal had an extensive dermatitis, but it does not show well in this picture. It is the same animal as shown in figure 3.

The following morning this same barrow, which during the whole experiment had always come to the feed-trough, came up and started eating as usual at feeding time. About 15 or 20 minutes later, it suddenly started squealing and fell to the concrete, where it remained for two or three minutes. It then got to its feet, ran for a distance of two or three yards, showing this peculiar incoördination, and fell in an unnatural position, lying on the sternum with the head stretched forward and front legs stretched back. From here it fell to its side, after which it was never able to stand again. At this time it showed muscular spasms and incoördination in all four legs. In the course of four or five hours, these movements had changed to a rhythmic twitching movement, particularly noticeable in the hind legs. The animal was dosed with a large quantity of cod-liver oil that afternoon but died sometime during the night; the exact hour is not

known, but it appeared that death had probably taken place some time before midnight.

This was the only case in the 30 animals fed experimentally which showed these symptoms and which died in such a short time, but it is evidencec that death can take place quickly with very acute symptoms as a result of vitamin-A deficiency.

Careful postmortem examination of affected animals failed to show any gross lesions other than the dermatitis and a gastroenteritis. The characteristic lesion on microscopic examination is a fatty degeneration or myelin degeneration of the nerves and spinal cord. In these particular animals there was no evidence on postmortem examination of any fractured vertebrae.

SUMMARY

A disease affecting several hogs weighing from 110 to 120 pounds and just coming off of a weanling-pig experiment has been described. It was diagnosed as avitaminosis A in swine or vitamin-A deficiency. The interesting and important point about this finding is the fact that this trouble developed in pigs that were well fed, well cared for and which had received a ration that was considered to be adequate in vitamin A content. The same ration was fed for four consecutive years to the same class of pigs but the only trouble of this kind ever observed on this farm was in the third year, or 1933.

In attempting to supply vitamin A to the ration and correct the symptoms observed, best results were obtained when affected animals were allowed to run on good bluegrass pasture. The possibility of some other factor besides vitamin A being involved should be kept in mind. The reason that other affected pigs which were given cod-liver oil and alfalfa hay did not make complete recovery is not just clear but may be explained in part by the fact that the nerve changes were too well established to regenerate completely.

Microscopic examination of the spinal cord and sciatic nerves showed unmistakable evidences of a fatty change or a myelin degeneration when this examination was made early or shortly after the first symptoms of incoördination developed. After several weeks had elapsed, even though the animals still showed symptoms, it was not possible to demonstrate the fatty change when employing the same technic. The Marchi technic gave us more satisfactory results than any other method tried.

In another experiment young shoats that were fed experimentally a ration known to be deficient in vitamin A developed symptoms of vitaminosis A in as short a time as two months

but in most of our animals it took about 90 days or longer before many cases were produced. The most characteristic symptoms observed were diarrhea, emaciation, muscular incoördination, blindness, dermatitis, intense itching, and in white hogs a marked pink color of the skin. Resistance to secondary infections was greatly lowered.

When severely affected animals were changed to a good ration and sufficient vitamin A was made available, marked improvement was noticed in from seven to ten days. Complete recovery, if it does take place, requires a much longer time. We found sufficient vitamin A was made available when we added high grade cod-liver oil (tested for vitamin A content) to the extent of 1 per cent of the ration, or when we added fresh green feed, cut daily, or well-cured alfalfa hay with a good green color. It may be that a greater amount of cod-liver oil would have been more beneficial, but the amount given gave us good results in these cases. The question has been raised in our minds as to whether or not we have been overlooking the vitamin-A factor when dealing with some of these so-called posterior paralysis cases which are so common in swine and which we see or hear of so often. Possibly some of these skin eruptions or dermatitis frequently observed also are associated with such deficiencies.

ACKNOWLEDGMENTS

I wish to take this opportunity to thank Professor L. A. Weaver, Dr. A. J. Durant and Dr. A. G. Hogan, of this experiment station, for their assistance and helpful suggestions in making this study possible.

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Dog Follows Master in Death

A story of deep devotion is that which concerns Yip, a mongrel Airedale, and the late Alfred I. Du Pont, wealthy munitions manufacturer. The dog, wandering over the Rock Manor Golf Course, near Wilmington, Del., two years ago, wagged his tail at Mr. Du Pont, who stopped to give him a friendly pat. From that time on, the two were inseparable companions. Where went Mr. Du Pont, there went Yip. When the magnate died, April 29, 1935, Yip's heart was broken. He refused food and pined for his lost companion. Two weeks later, he too was dead. His body was buried near that of his beloved friend.—*Animaldom.*

EXPERIMENTS ON SURRA*

By MIGUEL MANRESA *and* B. M. GONZALEZ
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No problem has puzzled investigators on surra more than the disharmony between beliefs regarding the disease that are generally accepted as facts and the upward trend in the animal population following the outbreaks of surra epizoötics in any locality or region. In 1911, Nesom[1] reported that in the Philippines surra was very widespread. Kelser,[2] in 1927, found that over 50 per cent of 141 carabaos he examined and 22 per cent of 54 oxen, from different localities on the island of Luzon, were carriers of the surra organism. One finds through perusal of the literature that in surra-infected districts practically every blood-sucking insect pest of horses, oxen, water buffaloes, dogs and other animals has been proved by one investigator or another to be an agent in the transmission of the disease (Bubberman,[3] Kelser[2]). It is generally accepted that the horse invariably succumbs to the disease; and some claim that the oxen and water buffaloes, once infected, become perpetual reservoirs of the infection although they may show little evidence of it, as long as they are kept under favorable conditions. Yet, despite this implied hopelessness of the situation, the animal populations, including horses, in the surra-infected localities have invariably increased (C. W. Edwards,[4] J. T. Edwards,[5] Kelser[2]).

Our experiments on surra in the College of Agriculture were begun during the outbreak of that disease among our animals in 1933. The disease was first discovered in the herds on December 2, 1933, in a Holstein-Friesian bull which exhibited the acute symptoms of surra before its death. The occurrence of an unusually high rate of mortality in our animals in the months of September, October and November, 1933, led us to suspect that surra must have been introduced into the College herds shortly before this time. Rather unfortunately, the most valuable animals were among the first to succumb to the disease, but instead of wailing over the misfortune, the modes of attack were fortified, laying down at the same time plans for an intensive investigation of a number of phases of the disease.

In the absence of specific curative and preventive treatments against the disease, and because at the beginning the Department

*Read at the Third Philippine Science Convention, March, 1935. Contribution from the Experiment Station, published with the approval of the Dean of the College of Agriculture. The data contained in this report were obtained from two papers on the subject published in the *Philippine Agric.*, vol. 23, nos. 9 and 10, 1935.

of Animal Husbandry did not have facilities for keeping surra-infected animals on its premises, the immediate destruction of all animals found positive under the microscope was resorted to in the attempt to prevent the spread of the infection. A total of two horses, 13 oxen and 15 carabaos belonging to the College of Agriculture were thus destroyed in the period from December 5, 1933, to February 7, 1934. This method, however, was modified when, on January 26, 1934, after some 86 of our animals had been tested for surra by the complement-fixation test by the U. S. Army Medical Research Board, it was found that 60 per cent of the oxen and 42 per cent of the water buffaloes were positive.

Among other things, the modified program of the investigational work called for microscopical examinations, complement-fixation tests and animal inoculations of all susceptible animals at suitable intervals. From those animals showing strong positive reactions by the complement-fixation tests samples of blood were taken and injected into rats. If the inoculation proved positive also, the infected animals immediately were placed in an isolation barn protected from flies by wire screen. Thereafter microscopical examinations, complement-fixation tests and animal inoculations constituted a regular routine (Manresa[6]). The U. S. Army Medical Research Board was kind enough to extend coöperation by performing the complement-fixation tests subsequently and when that Board was transferred to the Panama Canal Zone in June, 1934, negotiations were made with the local Bureau of Animal Industry for the continuation of these tests.

One rather unexpected result obtained in this work was the discovery of cases in both the taurine and bubaline species of cattle which had been positive in the complement-fixation tests becoming negative in subsequent tests. These cases seemed unbelievable in the face of the generally accepted belief at the time that definite recovery with complete disappearance of the infective organism from the body tissues of the host does not occur. But cases of this type kept on occurring and at the present time no less than 22 have been entered in our records. The problem appeared to be sufficiently striking to warrant critical study, and the question that came up was what criteria should be used in determining the existence of definite recovery. It was thought that if an animal has been found infected with surra by actual presence of the organism in its blood, it can be considered as having subsequently recovered from the infection when the following conditions shall have been fulfilled: (1) negative for not less than four weeks in daily microscopical blood examinations;

(2) laboratory animals inoculated with large doses of its blood failing to die; (3) repeated negative reactions to the complement-fixation test. Therefore, these were the three criteria used in our studies. At this writing, nine cases, of which four were water buffaloes and five were oxen, have actually gone through these rigorous requirements.

A somewhat detailed history of cow 121, named Caroline, to mention only one case, may be given in order to illustrate the application of our plan. This cow was found positive for surra on January 26, 1934, in the complement-fixation test performed by the U. S. Army Medical Research Board. The trypanosome organisms were detected in the peripheral circulation of the cow on February 12, 1934, in blood smears sent to Dr. M. A. Tubangui, of the Bureau of Science, Manila, who identified them as *Trypanosoma evansi*. A rat inoculated with 2 cc of the cow's blood on March 14, 1934, showed the trypanosomes five days after inoculation and died nine days later. Complement-fixation test of the cow's blood made once more by the U. S. Army Medical Research Board, on March 14, proved positive. On April 2, 1934, another rat inoculated with 3 cc of the cow's blood died also. A horse inoculated with 2 cc of the cow's blood on April 19, 1934, exhibited numerous trypanosomes in the peripheral circulation five days after inoculation and died later with the characteristic symptoms of surra observed both clinically and by the post-mortem lesions. Complement-fixation test for surra on the cow, made by the Army Research Board, on April 19, 1934, was positive. There can be no doubt, therefore, that cow 121 was infected with surra. All this time daily microscopical blood examinations were made.

On July 28, 1934, five months after the last positive microscopical examination, a third rat was inoculated with 4 cc of the blood of cow 121. This rat failed to show any trypanosomes in the daily microscopical blood examination for 60 days. After that period, examinations were made every week and at the time of the writing of this paper the rat was still negative for surra and appeared vigorous. Complement-fixation tests on the cow made by the Philippine Bureau of Animal Industry, on July 30, August 29, and November 8, 1934, all proved to be "weakly positive." On August 29, 1934, another horse was inoculated with 4 cc of the cow's blood. This horse never showed any trypanosomes in the daily blood examinations for 60 days or in the weekly examinations thereafter. The horse was tested for surra by the Bureau of Animal Industry by complement-fixation, before being inoculated and was tested again, 22 days after inocu-

lation. Both results proved to be negative. On December 31, 1934, that is, 124 days after inoculation, the horse was still vigorous and free from infection. A fourth rat was inoculated with a large dose (5 cc) of the cow's blood, on October 27, 1934. The rat has remained negative in the daily and weekly microscopical blood tests and is still vigorous at this date. The complement-fixation test made on the cow by the Bureau of Animal Industry, on December 13, 1934, was negative. Microscopical blood examinations made daily from February 15 to November 8, 1934, and every week after November 8 up to the present, have failed to show the presence of trypanosomes in the peripheral circulation of the cow. On August 12, 1934, the cow dropped a healthy calf and at present both mother and calf are in very good condition.

In all these tests we have never had a single case where an animal exhibiting the trypanosome organisms in the blood-stream has tested negatively in the complement-fixation tests. On the contrary, invariably all the animals found positive for trypanosomes under the microscope have proved positive by complement-fixation also. In due time the results of this and of other phases of the experiment will be reported in detail. For the present we are presenting only the most outstanding findings. We have found that in the oxen both the acute and subacute manifestations of surra occur. In the water buffaloes the disease generally follows a mild course. In our experiments cases showing the acute symptoms were invariably followed by death; the subacute and mild cases lingered for varying lengths of time with periods of paroxysms during which there was a rise in temperature. It was in these subacute and mild cases that definite recovery, without medication, occurred. The ages of the oxen which recovered varied from one to 13 years and comprised native oxen, Indian Nellore, and crossbred cattle possessing the blood of the Hereford and Holstein-Friesian. In the water buffaloes the ages varied from two to seven years and included native carabaos, Indian buffaloes and crossbreeds. Apparently the sex of the animal had no effect on its power of recovery.

We have also found very strong evidences of the existence of individual resistance against the disease in both the oxen and water buffaloes. These evidences are furnished by the animals which have remained negative by repeated complement-fixation tests although they had been herded together with surra-infected animals for as long as one year. This condition could not be attributed to the absence of insect vectors, inasmuch as our studies on the incidence of Tabanidae, acknowledged as the most

important agent in the dissemination of surra, showed that the tabanid flies are ever present on the College of Agriculture fields the whole year round. The only time we could not get the flies was when we did not go out to collect.

On the basis of the foregoing results we have advanced the hypothesis (Manresa and Gonzalez[7]) that in any locality, region or country the animals may be classified into three general groups with respect to their behavior to surra, namely, the resistant, the susceptible, and the indifferent groups. Under normal conditions the trypanosome organisms do not thrive in the system of the animals belonging to the resistant group. The susceptible ones are readily infected, manifesting the acute symptoms of the disease and dying out; while the indifferent animals are affected in such a way that they tolerate the infection in varying degrees, and may eventually get rid of it under favorable conditions.

This hypothesis, we believe, will account for the upward trend in the animal population in any given surra-infected region. For, with the elimination of the susceptible animals, a relative increase in the number of the resistant ones will take place. These tend to increase in spite of the presence of the scourge. The animals belonging to the indifferent group, however, produce offspring which differ in their reaction to the disease, the susceptible ones dying off as long as infection persists. It seems reasonable to assume that in time, with the elimination by death of the susceptible individuals, the disease gradually becomes extinct.

This explanation, by the way, may account to a certain extent for the present state of rinderpest in the Philippines, and it would be of extreme value to determine whether the decrease of rinderpest cases is due to the artificial intervention, such as the use of biologics, or to natural selection. The problems brought out in the present experiments are so important as to warrant the continuation of the work. The rôle of heredity and the interaction of other factors, both natural and artificial, such as for example, the use of chemotherapeutic agents, must be properly evaluated before they can be advocated as rational measures of control of the disease.

ACKNOWLEDGMENTS

The writers wish to acknowledge their indebtedness to the U. S. Army Medical Research Board and to the Bureau of Animal Industry for the coöperation received, without which these experiments would have been incomplete. Special thanks are due to Colonel Geo. H. Koon, Major Raymond Randall and Lieut. A.

T. Thompson, and to Drs. V. Buencamino, T. Topacio, N. S. Sevilla and R. A. Acevedo, for their coöperation in the conduct of the complement-fixation tests.

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Indemnity Payments Increased

Indemnity payments for grade dairy and beef cattle reacting to the official tests for tuberculosis and Bang's disease have been increased by $5, bringing the maximum payments up to $25 per head. The increased indemnity was authorizd on June 10, 1935, by Secretary of Agriculture Wallace, in amendments to previous U. S. Bureau of Animal Industry orders.

The payment was raised from $20 to $25 partly because of higher cattle values and partly because of more rigid sanitary requirements, involving expense to cattle-owners in controlling Bang's disease and complying with the designated means of preventing further infection. The higher indemnity applies to reactors to either test made in the course of regular testing or that authorized by emergency legislation. Although $25 is the new maximum amount, actual payment is governed, as heretofore, by the appraised value of the animal. In the case of pure-bred cattle, the maximum indemnity of $50 remains unchanged.

He Went Through College

Sig, mascot of the Sigma Alpha Fraternity at James Milliken University, Decatur, Ill., is now a Bachelor of Canineology, having received his degree recently before a crowd of 1,000 of his well-wishers. Sig had attended classes regularly for the past four years.

The dog is mentioned in the Bible 18 times, while the cat is overlooked entirely.

SOIL, IRON, COPPER AND IRON IN THE PREVENTION AND TREATMENT OF ANEMIA IN SUCKLING PIGS*

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INTRODUCTION

Doyle, Mathews and Whiting,[1] Hamilton, Hunt and Carroll,[2] Hart, Elvehjem, Steenbock, Bohstedt and Fargo,[3] Schofield,[4] Fulton,[5] Kernkamp[6] and others have shown that "anemia" often occurs in suckling pigs that are confined in pens with hard-surfaced floors which have been kept reasonably clean and free from soil. From the work of these investigators, together with certain observed facts pertaining to the occurrence of this disease in the field, it can be quite definitely stated that the conditions favoring the development of this syndrome are those which preclude the consumption, by the suckling and baby pig, of soil or its equivalent. In support of this, studies and observations have shown that when suckling pigs, beginning when approximately one week of age, have the opportunity to ingest sufficient soil or its equivalent, the "anemia" syndrome does not occur.

PRESENT INVESTIGATION

The purpose of the present investigation was to obtain more specific information on the relation of soil to the disease of newborn and baby pigs called "anemia of suckling pigs." The importance of a procedure as simple as that of permitting suckling pigs to ingest soil in order that they should escape the rigors incident to this disease was considered of sufficient magnitude to warrant further study. The investigation also includes a study of some of the soil constituents and their relation to the syndrome as it occurs in suckling pigs.

METHOD OF PROCEDURE

The name used to designate this disease, "anemia of suckling pigs," is descriptive of one of its principal characteristics, that of an anemia. It belongs to that class of the anemias known as secondary or simple anemia. Throughout the course of the disease in a suckling pig, certain blood changes occur which can be used as a reliable measure indicative of its progress. Be-

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cause of this feature, frequent examinations of the blood were made, and the results of these examinations form the basis of this paper.

While the value of a measurement which yields information as to the progress of a disease is of much importance, the ability to produce the disease is even greater. Fortunately, practically no difficulty was experienced in causing the development and progress of the disease in suckling pigs. The method followed was essentially the same as described by the writer in 1932.[6] Briefly, it was as follows: The sows whose offspring were to serve as the "anemia" pigs, were confined indoors, in a pen, the floors of which were constructed of concrete. They were placed in these pens about two or three days before parturition. Just enough straw was put in the pen to provide a comfortable farrowing bed and a nest for the newborn pigs. The pens were big, providing 180 square feet of floor space, and therefore, a large area of the floor was devoid of all litter. The pens were cleaned each day. No special care or treatment was given the sows prior to or after the time of parturition. Ground corn, ground oats, a protein supplement, and bone meal were mixed together and served them as foodstuffs. After farrowing, the sow and the pigs remained in this pen at all times, unless otherwise noted. These were the conditions found to be the most favorable for the development of anemia.

The blood examination consisted of a hemoglobin determination, a total red and a total white blood cell count, a differential leukocyte count, and an examination of specially stained smears. The blood was obtained by venipuncture of an auricular vein. Examinations were made on every pig recorded. The first examination was made on the day of birth and all subsequent examinations at regular weekly intervals. The examination made on the day of birth always was made within six hours of the time of birth. If not made by this time, it is recorded as of the second day. Many of the birth-date examinations were made as early as three minutes after the pigs were born and a great many within two hours of the farrowing.

Of the blood constituents examined, hemoglobin (Hb.) was the most valuable and the determinations the most accurate. Another valuable measurement was the number of red blood cells (R.B.C.). Hemoglobin measurements were made according to the Newcomer method[7] and recorded in grams per 100 cc of blood. The presence of reticulocytes and their number per 100 R.B.C. was frequently determined and usually found to be most valuable. The number of white blood cells (W.B.C.) and the

differential leukocyte counts were not of particular value in this study, and nothing more will be said concerning them for the present.

The data consist of a large number of individual measurements. For purposes of analysis it was found more satisfactory to convert the actual measurements into percentile values. The percentile values provided a more comparable statistic for evaluating differences between individual pigs, between litters of pigs and between groups of pigs on the same treatment or between different treatments. They are computed on the basis of the real values for the blood constituents examined at the time of birth. Thus, all decreases or increases below or above the amount obtained at birth are expressed as the percentage of change. For example, pig A at the time of birth has 12 grams of Hb. per 100 cc of blood and one week later 8 grams. Pig B, on the other hand, has 8 grams of Hb. per 100 cc of blood at the time of birth and 4 grams one week later. The actual decrease in both cases is 4 grams, but the relative decreases are quite different. The decrease of Hb. in A is equal to 33.3 per cent, whereas it is equal to 50 per cent in the case of B. In fact, the relative differences are usually of greater importance than the actual differences insofar as this disease is concerned. The usual statistical procedures for analysis of similar data have been omitted. They did not evaluate the data in terms of the premise stated above, namely, that a previous measurement has a definite influence on the correct interpretation of a subsequent measurement. Therefore, such types of analyses have been omitted.

The Control Pigs

In an investigation designed to study the effects of preventive and curative treatments, the control or check animals constitute an important part. The controls in this investigation were the untreated pigs. They were, in fact, the pigs that were permitted to develop the disease—*"the anemics."* For this purpose 125 pigs were used.

The pigs constituting the controls were in many respects an interesting group. They were the progeny of 32 sows. In some cases an entire litter was left as a control, while in others only a part of a litter was used. In this respect they constitute a heterogenous pig population. As might be expected, considerable variation in the amounts of Hb., in the numbers of R.B.C. and of W.B.C. and in differential counts was observed.

For the purpose of illustrating variations in the amount of Hb. at the time of birth, the pigs of the control group have been

arranged into six sub-groups or lots. In lot A were those having from 11 to 11.9 grams Hb. per 100 cc; B, 10 to 10.9; C, 9 to 9.9; D, 8 to 8.9; E, 7 to 7.9 and F, 6 to 6.9 grams. Chart 1 gives a graphic portrayal of the changes which occurred from week to week with respect to the actual measurements of Hb. Chart 2 shows the same data, except that the real values are converted to the relative change in percentage.

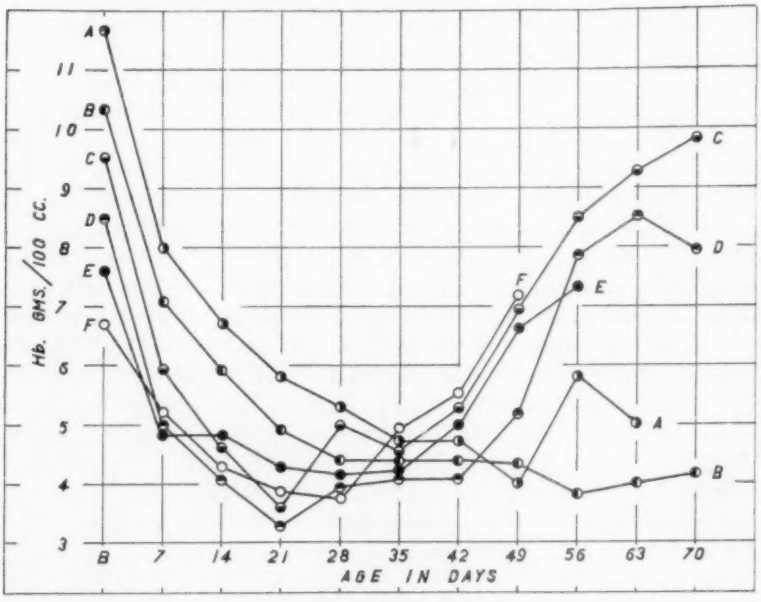

CHART 1. Showing the average amount of Hb. in grams per 10 cc of blood on six different lots of pigs that were living under the conditions favorable to the development of anemia. It shows the actual changes in the Hb. content of the blood for each of the six lots at regular weekly intervals, beginning with the amount present at time of birth. (Compare with chart 2.)

These charts show in a very clear way that there was considerable variation in Hb. at the time of birth. They show further that in every lot a decrease in Hb. occurred the first week. This was equal to 22.4 per cent in the case of lot F and 41.2 per cent in lot D. The first week represents the period when the greatest relative decrease occurred in all lots. In lots A and B, the lots with the highest actual values at the time of birth, there was a more or less progressive decrease of Hb. for the first seven or eight weeks. The relative decreases were as much as 50 per cent below the birth value from the third to the tenth week in the pigs of lots A and B. Later, however, these returned to levels more characteristic of older swine. It appears that pigs

that have 10 or more grams of Hb. per 100 cc of blood when born, and pass through the syndrome of anemia, suffer a greater relative loss of Hb. than pigs having a lesser amount at the time of birth. Furthermore, they are much slower to recover. Lots C and D are more typical of the general swine population. The greater number of pigs studied belong in these categories. The average relative Hb. loss for the pigs in each of these lots was greater for the first three weeks than for the pigs in lots A, B, E and F.

The pigs in lots C and D, beginning the fourth week, show a progressive increase in Hb. This continued, so that by the ninth week the Hb. was practically equal to its level at time of birth. The rigors of the disease were most marked in these pigs during the period from the second to the sixth week. The pigs, which at the time of birth had less than 7 grams of Hb. per 100 cc (lot F) and survived the disease seem to have the ability to recover more rapidly than any of the others. The Hb. of the pigs in this lot returned to the birth level about two weeks earlier than those in lots C and D. The pigs of lot E paralleled those of lot F the second, third and fourth weeks. After this, there was a lag in lot E for one week before a perceptible change occurred, and then the recovery more nearly paralleled lots C and D. (See chart 2.)

In the discussions that follow, in which comparisons are made between treated and untreated (controls), the average or mean Hb. values of all the pigs that served as controls is used. This reduces the data to values which are more representative of the general pig population.

Of the 125 pigs comprising the control group, eleven (8.8 per cent) did not exhibit blood changes or other clinical signs characteristic of anemia. These pigs were not discovered until the examinations made on the 14th day were completed. This was more definitely confirmed on the 21st day. One hundred fourteen pigs (91.2 per cent) developed anemia in a greater or lesser degree. Of this group 33 (28.9 per cent) succumbed and anemia was considered the primary cause of death. The ages when death occurred are of interest. Three (9.1 per cent) died between the ages of eight and 14 days; five (15.1 per cent) between 15 and 21 days; ten (30.3 per cent) between 22 and 28 days; ten (30.3 per cent) between 29 and 35 days and five (15.1 per cent) after the 36th day. Eighty-one (71.0 per cent) of the pigs passed through the syndrome and recovered. The recovery was spontaneous.

Spontaneous recovery from anemia is explained by the fact that the suckling pig, when partaking of foodstuffs other than its mother's milk, ingests substances that are beneficial to hemoglobin and R.B.C. regeneration. The interesting point in regard to spontaneous recovery is the relationship between the time it occurs and the time a suckling pig begins to eat solid food. In an effort to get more definite information on this matter, a record was made in a number of cases of the time the suckling pig gave first evidence of eating food and the time its "blood-picture"

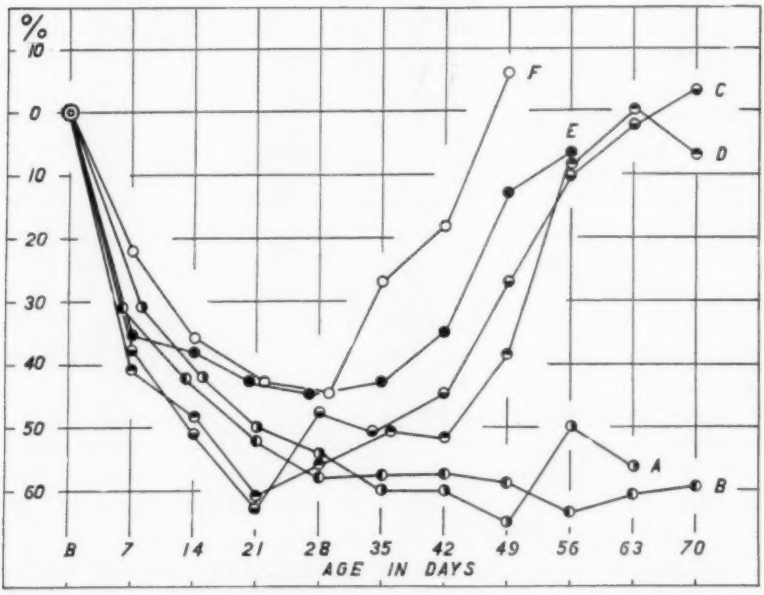

CHART 2. The percentage changes in amount of Hb., determined at each examination period for each of the six lots represented in chart 1, are shown here. It is to be noted that the birth value in each case becomes zero since the percentage of change is calculated from the difference between the reading at each examination and the actual amount at time of birth. Thus, in the case of lot A, where the amount at birth equaled 11.6 gm and 8 gm when 7 days old, this difference is equal to a decrease of 31 per cent. (Compare with chart 1.)

showed signs of improvement. The results showed that an interval of several days usually elapsed between the first partaking of food and the finding of a more favorable "blood-picture." The period in the life of the pig when it begins to "nibble or pick at the trough" is some time during the fourth or fifth week. It may be even earlier than this in some cases.

The discussion has been confined to the hemoglobin content of the blood. The reason for this is because the hemoglobin in

this disease is involved to a greater degree than are the red blood cells. The disease is more particularly an *oligochromemia* and less particularly an *oligocythemia.*

The Soil Groups

Floor covered with loam soil: The problem of prevention and treatment of anemia in suckling pigs is one which must be applicable in the very early days of life. The investigations on this disease show that it is a condition which is most progressive the second, third and fourth weeks after birth. Therefore, whatever can be done to escape the syndrome should begin soon after birth.

Kernkamp,[6] in 1932, pointed out that when pigs were farrowed and kept in pens, the floors of which were covered with loam soil, the disease recognized as anemia of suckling pigs did not occur. The amount of Hb. and the number of R.B.C. of these pigs were superior to those of the pigs living under conditions favorable to the development of this disease. While the results of the earlier experiments indicated that there was something in the soil which was responsible for the differences, it was considered advisable to repeat the experiment to see whether similar results could be obtained. In the present experiment, four sows were permitted to farrow in pens, indoors, where the floor was covered with loam soil to a depth of about four inches. To these sows 25 pigs were born and they were kept in these pens for two months. The results were practically identical with those previously reported.[6] In this experiment as well as in the former, a rather marked decrease in Hb. occurred in both the treated pigs and the controls during their first week of life. The decrease was equal to 25 per cent in the treated pigs and 31 per cent in the controls (chart 3, G). When the blood was examined on the 14th day, there was definite evidence that the Hb. was increasing and at the 21st day it had reached the level recorded for birth. For the subsequent six weeks, the Hb. remained quite stationary at a level equal to about 5 per cent above the original. In the controls, the Hb. continued to decrease during the first three-week period, remained stationary for another two weeks, and then began to increase slowly throughout the remainder of the experimental period of 70 days.

Box containing loam soil placed in the pen: The necessity of having the entire floor space of the pens covered with soil is a matter of considerable inconvenience in swine-breeding establishments where ten or more brood sows are maintained. There is, however, another problem which is of considerable importance

where baby pigs are being reared, that of hygiene and sanitation. If the pigs are obliged to remain indoors and in dirt-floored pens, the problem of sanitation must not be overlooked. For obvious reasons, it was imperative that some method of supplying soil be devised so that the matter of covering the entire floor space might be eliminated. A simple procedure, consisting of placing a small box or flat in the pen and keeping this filled with soil, was tried on three different litters. The boxes were 18 inches square and one inch deep and kept level full with loam

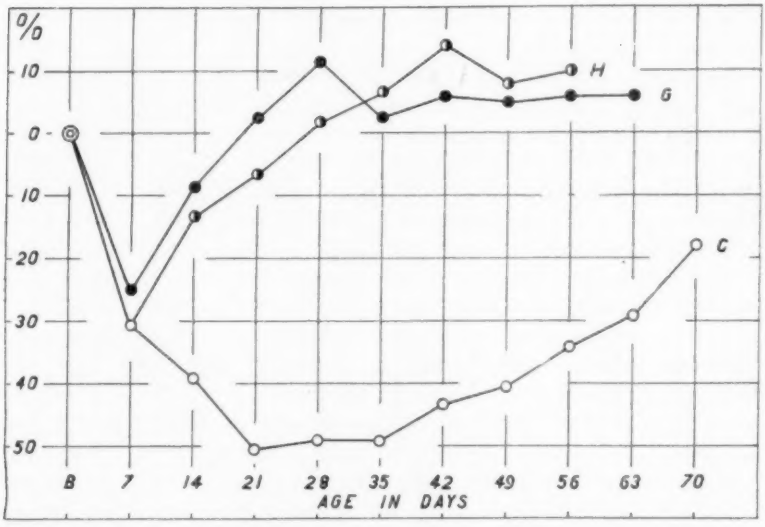

CHART 3. The relative percentage value of Hb. between anemic pigs (C) and pigs that could ingest soil (non-anemics.) The pigs represented in lot G were kept in soil-floored pens (loam soil) and lot H had access to a small tray or box which was kept filled with loam soil at all times.

soil. The boxes were placed in one corner of the pen and behind a creep or rail so that the sow could not upset or trample in them. In this way the soil was available to the baby pigs at all times.

Three litters consisting of 33 pigs were used in this experiment. The boxes were not placed in the pen until the seventh day, since baby pigs usually stay close to the dam for the first few days. Their display of inquisitiveness and their desire to root and eat dirt begins about the third or fourth day. The results obtained by this procedure were entirely satisfactory and compare very favorably with those obtained when the pigs were on the soil at all times (chart 3, H).

Floor covered with gravel soil: An experiment was begun to determine whether gravel soil would give results comparable to

those obtained when loam soil was used. In this case, a clay and sand type of gravel soil was spread over the entire floor of the pen to a depth of approximately three inches. The pigs were farrowed and kept in these pens throughout the entire period of the experiment. The progeny of three sows, twenty-eight pigs, were used in this experiment. Examinations of their blood were made at the time of birth and once each week for the following eight weeks. In general, the results obtained on this group were very similar to those obtained when loam soil was used. The

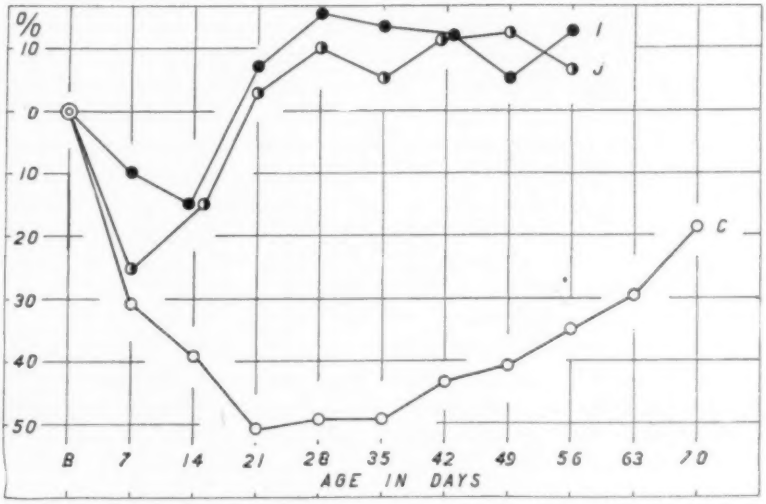

CHART 4. The relative percentage value of Hb. in pigs that were kept in gravel-floored pens at all times (lot I) and a series that were raised in a gravel-floored pen out of doors (lot J). Lot C consisted of the controls.

specific results show that at the end of the first week the Hb. was 10 per cent below the birth level and 15 per cent below the second week (chart 4, I). The examinations made the third week show that a decided increase in Hb. had occurred, and the values obtained were equal to 7 per cent more than the amount present on the day they were born. The next week gave still higher values. The value at this time was equal to 15 per cent above the original. It remained at this level for the remainder of the experiment. At no time did any of these pigs exhibit evidence of the disease.

Pigs farrowed and reared out of doors: It had been the practice throughout this investigation to rear the suckling pigs indoors because the syndrome characterizing this disease could be induced when the pigs were raised under these conditions. In

view of our experience, whether or not the pigs were reared indoors or outdoors did not appear to be important. It was considered advisable, however, to study a series of pigs that were farrowed and reared outdoors.

Four litters containing 37 pigs were farrowed and reared in pens which were on gravel soil and in which no vegetation was growing. The farrowing occurred in May and June and therefore they could be left out of doors at all times. A small shelter was provided.

The Hb. at the end of the first week was equal to 25 per cent below the value at birth. When the pigs were 14 days old, it was 14 per cent below the birth value but it was 3 per cent above on the 21st day. The value on the 28th day was 10 per cent above birth and it varied between 12 per cent and 5 per cent above the original for the remainder of the experiment. Chart 4, J, gives a graphic picture of the values obtained on the pigs farrowed and reared on gravel soil out of doors and on the pigs farrowed and reared under the conditions which are conducive to the development of anemia.

A comparison of the results of this experiment with those in which the pigs were reared indoors but had an opportunity to consume soil indicate that the soil was the principal factor responsible for their escape from the disease. Furthermore, the results support the field observations that the disease is seldom seen in pigs that can be out of doors and on the ground at a very early age.

The administration of loam soil in measured amounts: It was more or less presumed that the favorable results obtained in the experiments heretofore described occurred as a consequence of the pigs eating soil. The evidence that they actually did eat the soil was based upon the fact that on many occasions they were seen rooting in the soil and moving their jaws in the manner of chewing and masticating and finally swallowing. Furthermore, insofar as this disease is concerned, it seemed superfluous to suppose that the soil benefited them in any other manner than by entering the alimentary canal. In order to obtain more specific information on this question, the following experiment was undertaken.

To a series of pigs that were living under the conditions which favor the development of anemia, measured amounts of loam soil were administered *per os*. The soil used was part of the same loam soil used in the experiments reported above. It was first spread out in trays and dried at room temperature after which it was pulverized, sifted and then ground to a fine powder in a

mortar. Measured quantities of the powdered soil were put into No. 2 gelatin capsules so that each capsule contained approximately 600 mg. The capsules were administered with a balling-gun.

Thirty-four pigs (five litters) were used in this experiment. Eight were given 600 mg (chart 5, K); nine, 1,200 mg (chart 5, L); nine, 1,800 mg (chart 5, M); and eight, 2,400 mg (chart 5, N). Treatment was begun on the seventh day after birth and continued each day until the 63rd day. Three of the pigs in lot K died before the 42nd day, and two in lot L died before the 35th day. They exhibited changes characteristic of "anemia." Two

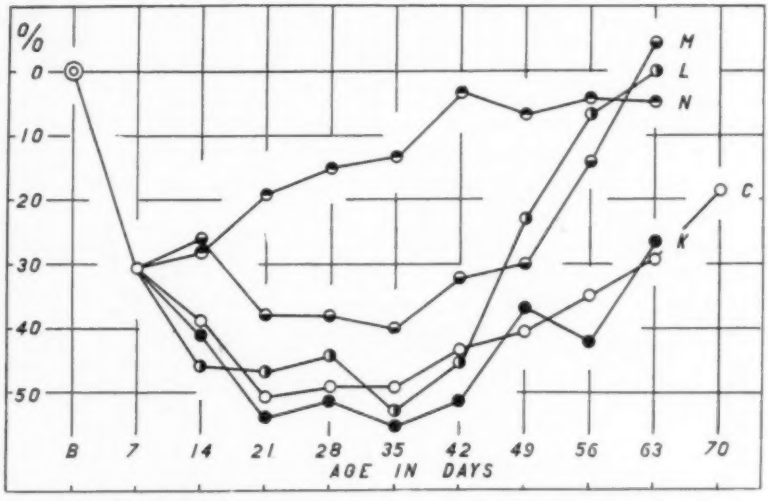

CHART 5. The relative percentage value of Hb. in four lots of pigs receiving measured amounts of loam soil and a series left for controls. Lot K, beginning on the seventh day, received 600 mg of soil per day; L, 1,200 mg; M, 1,800 mg, and N, 2,400 mg. Lot C included the controls.

pigs in lot N died between the 14th and 21st days. The deaths in these cases were attributed to an enteritis which, it appeared, resulted from an impaction of the small intestine with the soil. A third pig from this lot was noticeably sick for three or four days, and it is quite probable that it too suffered from indigestion. Its period of illness occurred between the 10th and 16th days, *viz.*, the third day after treatment was begun.

The results point very clearly to the fact that 600 mg of the soil per day did not produce any effect on the course of the "anemia." In fact, the Hb. values of the pigs receiving 1,200 mg daily were not very different from those getting 600 mg or

different from the controls, especially for the period between the seventh and 42nd days. However, after the 42nd day, a very marked increase of Hb. occurred in the pigs of lot L. This recovery can not be ascribed to the soil alone since it is well within the period when spontaneous recoveries occur so that the effects of the elements contained in the food plus those in the soil are most likely responsible for the Hb. regeneration. Lot M received 1,800 mg of the soil each day and results show that a slight increase in Hb. occurred during the first week of the treatment. At the next examination period, seven days later, a considerable decrease in Hb. was noted, but the relative value at this time was not so low as in the two preceding lots or in the controls. Beginning with the 49th day, a marked increase in the Hb. occurred. This increase took place within the period of spontaneous recovery. The most striking results were noted in lot N. The pigs of this lot received 2,400 mg of the powdered loam soil each day. The Hb. values show a gradual increase beginning with the first examination after the treatment was begun. The effect of the treatment seems to be quite definitely established in this lot.

The deductions drawn from this experiment are: first, soil supplies something which is effective toward preventing the syndrome of "anemia" in suckling pigs; second, it must be ingested in order to be of value; third, pigs which have an opportunity to ingest soil apparently consume as much as 2,400 mg each day; and fourth, in order that they may be benefited by ingestion of soil, they must begin to consume it early in life.

Iron and Copper

The very favorable result subsequent to the ingestion of soil raises the question as to what in the soil prevents suckling pigs from developing "anemia." In order to answer this question it would be necessary that a complete analysis or assay of the particular soil be made and that susceptible pigs be given the elements, either singly or in combination in the hopes of learning which of the elements would be involved. It is regretted that this could not be done; therefore, another approach was sought. Some of the elements known to exist in soil were administered to pigs living under the conditions conducive to anemia.

The first of the elements to be studied in this way was iron. The relation of iron to blood is well known, and it was quite natural that this element should be selected. Furthermore, the benefits of iron in the treatment of certain types of anemia having been definitely established, it was reasonable to use it in

this disease. In order to avoid using copper-contaminated iron, a copper-free solution of iron was prepared.

Preparation of copper-free iron: Electrolytic iron was dissolved in 20 per cent HCl and 2 per cent HNO_3 and diluted to three times its solution volume. H_2S was then passed through the cold solution. The solution was then filtered and evaporated to dryness and heated. It was now taken up to 300 cc with dilute HCl and H_2S again passed through the solution for another 12 hours. The solution was then boiled to residue of 150 cc, filtered and diluted with copper-free water to 5.5 liters. It was then chlorinated to oxidize ferrous iron to ferric iron and boiled again with HCl to remove the Cl, after which it was made up to volume with copper-free water to make 0.001 gm Fe per cc. NaCl was added at rate of 8.5 gm per liter. Titration proved solution too acid. $NaHCO_3$ was added until $Fe(OH)_3$ precipitated, after which the solution was slowly cleared with small portions of 5/N concentrated HCl. Much of the CO_2 was removed by shaking. The solution now titrated .01/N acidity which was enough to hold the iron in clear solution.

The first experiment with copper-free iron involved the use of 21 pigs (three litters). Eleven pigs (lot O) received 5 mg of the copper-free iron for each kilogram body weight (5 mg/kg) and ten (lot P) received 10 mg/kg. The iron solution was administered directly into the stomach using a small rubber stomach-pump. The quantity given was measured with an all-glass syringe which could be connected easily with the tube. The treatments were given once each day for seven days beginning on the day of birth. The results of this experiment are shown in chart 6, (O and P). The effect of this treatment, in terms of the Hb. content of the blood, are very striking. At the end of the first week, which was the period of treatment, the Hb. decrease in lot O was equal to 11 per cent and in lot P 9 per cent, whereas the controls show a decrease of 31 per cent. The results show further that the Hb. increased slightly during the following week in both treated lots, although the treatment was discontinued on the seventh day. However, when the blood was examined on the 21st day, the Hb. had decreased markedly from the values of the week before. It continued to decrease for another two weeks and, beginning with the 42nd day, it began to increase again. The time when the increases occurred was the time when spontaneous recovery usually takes place. The blood-pictures on these pigs from the 21st to the 42nd day were quite typical of anemia.

It seems quite reasonable to assume that the iron was responsible for the comparatively slight decrease in Hb. during the first

two weeks. While no iron was administered after the first week, yet its effect was noticeable for at least another seven days.

A second experiment with copper-free iron included a series of 29 pigs (three litters). Twenty of the group were treated (lot Q) and nine left as controls. The treatment was begun on the third day and then every third day until nine treatments were given. The iron solution was administered at the rate of 10 mg/kg. The results of this trial (chart 6, Q) were quite satisfactory with regard to the disease (anemia). At the end of the first week, the Hb. had fallen to a point equal to 18 per cent below the amount at birth and remained close to this value

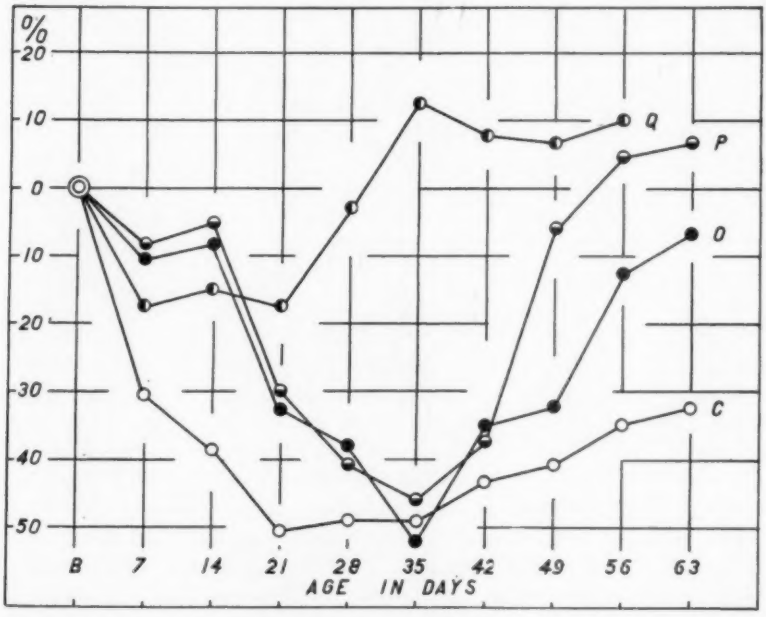

CHART 6. The relative percentage value of Hb. in pigs that received copper-free iron and those left as controls. The pigs of lot O received 5 mg of copper-free iron per kg body weight and lot P, 10 mg/kg. The treatment in each case was given once each day for the first week only. The pigs of lot Q received 10 mg/kg of the copper-free iron except that the treatments were given at three-day intervals, the first treatment on the third day and the last on the 27th day. The controls are represented in lot C.

for the next two weeks. When the pigs were 28 days old, the Hb. was only 3 per cent below the birth value, and after this it increased to values that were as much as 12 per cent greater than the original. After the 27th day, no further treatment was given. None of the treated pigs exhibited clinical symptoms of anemia although their blood-pictures on the 14th and 21st days

approached or tended in the direction of changes which are characteristic of the disease. It is probable, since these pigs always appeared well and healthy, that they began to eat food at an earlier date, and that the rather sharp increase of Hb. between the 21st and 28th days was responsible, in part, to the food. It appears that the iron contributed to the prevention of greater decreases in Hb. such as occurred in the controls. The rather constant leveling of the Hb. as recorded for the 7th, 14th and 21st days, shows that about 4 mg of iron per day is necessary to maintain a hemoglobin concentration in the blood sufficient to prevent the development of the disease. The results obtained with lots O and P might also be taken as supporting this assumption.

Before leaving the matter of using copper-free iron in the prevention of anemia, brief mention should be made of an experiment in which the solution was injected intraperitoneally. The reason for selecting the intraperitoneal route was twofold. First, to learn whether the results would be more effective, and second, it was the opinion that intraperitoneal injections could be performed more easily than the passing of a stomach-tube and therefore more adaptable. Two litters, comprising 13 pigs, were used for this test. It was planned to give daily injections of copper-free iron at rates equal to 5 mg/kg to six pigs and 10 mg/kg to seven pigs. The first injections were made on the second day after birth. Some pigs received only two more injections while others received five subsequent injections. This method of introducing the iron had to be discontinued sooner than planned because it caused extensive local irritation along the needle tract and contiguous regions which resulted in inflammation with necrosis. The Hb. value on these pigs when one week of age was not very different from that of the controls and there was but little difference between them and the controls when examined after another seven-day interval. It was concluded that the intraperitoneal administration of copper-free iron was of no value in the treatment or prevention of anemia.

The value of copper and iron in the treatment of nutritional anemia in rats has been reported by a number of investigators. In view of these records a series of suckling pigs were treated with a solution of copper and iron in the proportion of one part of copper to 1,000 parts of iron. The plan of the experiment was similar to that where the copper-free iron was used. Thus lot R (eight pigs) received 5 mg/kg of the copper-iron solution each day for the first week, lot S (ten pigs) 10 mg/kg daily for the first week and lot T (17 pigs) 10 mg/kg on the 3rd, 6th, 9th,

12th, 15th, 18th, 21st, 24th and 27th days. The solution was administered *per os* with a stomach-tube.

The results (chart 7) are in general very similar to those obtained with the copper-free iron solution. The initial Hb. decrease the first week was quite the same in each lot and was much less than in the untreated pigs. In lot R (treatment discontinued after first week) the Hb. continued to decrease from week to week until it reached its lowest point on the 35th day. After this a definite increase was noted which continued through-

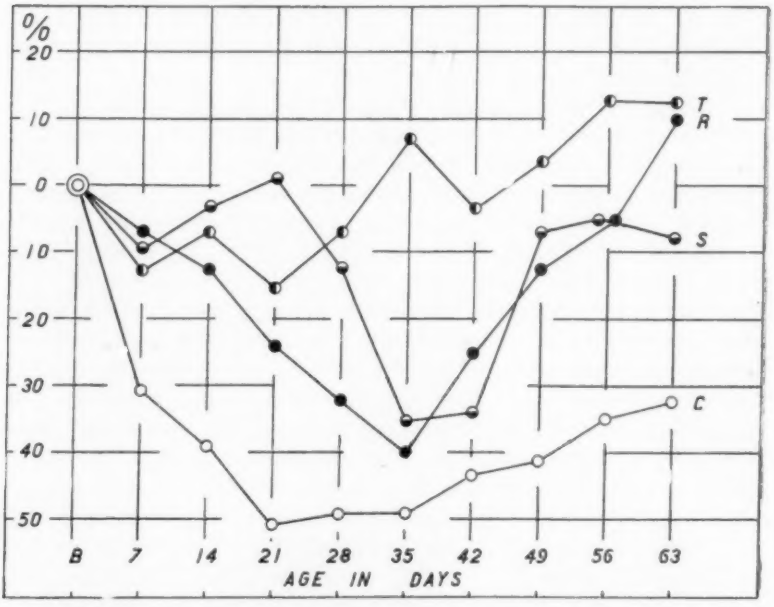

CHART 7. The relative percentage value of Hb. in pigs that received copper and iron solution (1:1,000) and a group of controls. Lot R received 5 mg/kg and lot S, 10 mg/kg each day for the first week. Lot T received 10 mg/kg at three-day intervals, the first treatment given on the third day and the last on the 27th day. Lot C represents the controls.

out the remainder of the experiment. Lot S received 10 mg/kg each day for seven days, and the readings on the 14th and 21st days (seven and 14 days respectively after treatment was discontinued) show values practically equal to those at the date of birth. After this a rather marked drop occurred, declining to a point equal to 36 per cent below the original. The value remained fairly low for another week and then in one week it rose to a point equal to 8 per cent below the birth value. The pigs receiving 10 mg/kg of the copper-iron solution every third

day (lot T) for a three-week period showed a Hb. curve that compares favorably with the curve in a similar group of pigs receiving the copper-free iron solution. The Hb. in this group, except for the value obtained on the 21st day, was never at a point indicative of anemia.

A comparison of the results on the loss of pigs that received copper and iron with those receiving the copper-free iron does not show differences which could be construed as important. In so far as the blood-pictures and the course of the syndrome are concerned, it does not appear that the addition of copper enhanced the iron. On the basis of these experiments, however, it is not the intention to disclaim the value of copper and iron in blood regeneration. It is recognized that complete avoidance of or freedom from copper was not strictly maintained in these experiments. In fact, it would be quite difficult to raise a litter of pigs under conditions where complete avoidance of copper could be maintained. The reason is chiefly because of the fact that *traces* of copper occur in the soil, in cereals, in wood, and elsewhere, and unless great care was exercised to avoid it, the pigs might ingest enough copper to provide them with a sufficiency by licking the floor, or from food, water, etc. The specific copper requirements are not known, but it seems reasonable to assume that the needs of the organism for this particular element are very small. Therefore, we cannot say that any or all of the pigs in any of these experiments did not ingest copper at some time. However, the experiments suggest that the copper, in the proportion of one part in a thousand parts of iron, did not contribute any significant beneficial effect on the Hb. content of the pigs receiving it.

Discussion

There have been presented certain facts relative to a disease of pigs of nursing age which is generally known as "anemia of suckling pigs." Definite information is not available with regard to the general prevalence of this disease in any reasonably large geographic area, but judging from some of the records and reports which have appeared in the literature and from conversation, correspondence and observation, the disease is more common than most persons realize. In some respects the disease is seasonal, but this aspect of it bears close relation to the husbandry practices employed on the farms where the disease occurs. The information on the occurrence of the disease under natural conditions reveals that it is most prevalent when the climatic conditions are such as to be necessary for the newly farrowed and very

young pigs to remain indoors at all times. In this section of the country, pigs that are born in February and March seldom have the opportunity to run out of doors and on the ground while still less than three weeks of age. The disease is most often encountered in this region during the early spring months. In contrast to this it must be stated that the disease seldom occurs during the late spring, summer and fall seasons, or, in other words, the times of the year when suckling pigs can be out of doors and on the ground.

The studies have shown very definitely that the syndrome characterizing the disease can be produced experimentally. In our experience, the procedure followed to produce the syndrome, namely that of confining the pigs in floored pens that were kept reasonably clean of soil and litter, was very satisfactory. Pigs maintained under these conditions developed blood-pictures and other clinical and postmortem changes similar to cases occurring under natural conditions. The fact that 91 per cent of the pigs permitted to develop anemia did run a course that in degree was considered typical of anemia, should be a convincing criterion for the method. The basis for concluding whether or not a pig was anemic was the relative change in the amount of Hb. present in the circulating blood, the changes in the numbers of red blood cells, the staining reactions of the red blood cells and their morphological characteristics. These were much more satisfactory than any of the physical symptoms which are manifested. Thus, on many occasions, a diagnosis of anemia would not have been rendered without an examination of the blood. In this connection it should be understood that in many cases when a diagnosis was made on the blood-picture alone, it was because we could compare the records of two or more previous examinations (usually a week apart) and note the relative differences and trends. In fact, relative differences can be determined only when two or more readings have been made.

The question of knowing when or when not a pig should be regarded as "anemic" is important. In our experience we would consider it anemic when the amount of hemoglobin present in the blood is equal to 30 per cent or more below the amount present at the time of birth. While this criterion is suitable in cases where the birth level is known, it is not applicable to field conditions where knowledge of the amount of Hb. present at birth is seldom known. In the case where only one observation can be made, it is reasonably conservative to consider that a determination which will give a value of 6 gm of Hb. per 100 cc of blood represents an amount characteristic of a mild or slight

state of anemia and that 4 gm per 100 cc is very definitely anemic. Values lower than this are not uncommon. In fact, we have had pigs recover from anemia that showed as low as 2.7 gm of Hb. per 100 cc of blood. Quantities as little as this, however, should be looked upon as a sign denoting an unfavorable prognosis.

For the benefit of those who may not fully appreciate the significance of the specific quantitative measurements of hemoglobin expressed in grams per 100 cc, Kernkamp and Donham[8] made a study of the comparative values of the Tallqvist, Dare and Newcomer methods for making Hb. determinations. On the basis of their study, a hemoglobin value equal to 60 per cent by the Tallqvist or Dare method is indicative of a slight state of anemia and 40 per cent a very definite state of anemia.

Having stressed the very favorable results in connection with producing the syndrome characteristic of anemia in suckling pigs, equal stress should be given to the successful prevention of it. The outstanding point in this regard is the fact that when suckling pigs have the opportunity to ingest soil, the disease does not occur. Anemia did not occur in a single instance where the pigs were in contact with soil at all times. This was true regardless of whether the pigs were out of doors or were obliged to remain indoors.

The very favorable results obtained when pigs had the opportunity to eat soil at any or all times and the many cases of anemia that developed when they were denied this opportunity, strongly suggested that the soil supplied the factor responsible for this difference. That this proved to be the case was definitely shown. It was found that when suckling pigs received 2,400 mg of the powdered loam soil each day, the blood changes characteristic of the disease did not occur. It was found further that when quantities as small as 600 mg were administered each day, the picture of anemia did occur. The results of this experiment seem to establish the fact that the soil did supply the substance which influenced hemoglobin regeneration and that if given the opportunity, suckling pigs will eat soil.

The inorganic composition of the soil used is not definitely known. A complete analysis of soil used would probably reveal most or all of the elements and rare earths occurring in soil in general. Robinson[9] analyzed a large number of soils which were obtained in various sections of the United States and, with few exceptions, the different samples contained the same elements. The differences in the soils were chiefly in the amounts of the various elements that were present. For example, he records a variation in the iron content between 0.83 and 16.23 per cent.

Variations greater than this are reported for some of the other elements. In regard to copper, Robinson says:

> While it seems likely that copper, nickel and cobalt are present in soils, neither the amounts nor even the presence of these elements has been established with certainty.

Since no analysis of the soil we were using was made, we relied upon the findings of Robinson as the basis for a study of some of the soil elements as they related to the problem under investigation. The element of first choice was iron. This was because iron has been quite generally considered to be one of the most valuable inorganic elements to cause hemoglobin and red blood cell regeneration. The experiments in which iron was administered each day or when administered at intervals of three days, beginning when the pigs are less than one week of age, indicate that this element plays an important rôle in regard to the prevention of anemia in suckling pigs. The results of the experiments suggest that it was probably the iron in the soil that was the factor giving to soil the power to cause a hemoglobin and red blood cell regeneration. The studies where copper was added to the iron did not indicate that copper contributed much to the value of iron in respect to its effect on hemoglobin regeneration in suckling pigs.

After studying the blood-pictures of a large number of cases of so-called anemia of suckling pigs, one is impressed with the frequency of the occurrence of certain conditions. The most marked and most frequent blood change is the decrease in Hb. This we have measured many times and we have definite quantitative values which show marked differences between amounts present at time of birth and when pigs are visibly sick and moribund. The low Hb. content of the blood was indicated by the paleness of the red blood cells when examined in smear preparations. This is known as hypochromasia. Because of the characteristic blood-picture, *i. e.*, oligochromemia and the hypochromasia, together with the fact that the regenerative processes are stimulated when iron is administered and that the syndrome affects baby pigs, the disease simulates a disease of humans recognized as an infantile type of chlorosis.

The disease in pigs is characterized by some decrease in the number of red blood cells, but the relative decrease in them is far less than the relative decrease in hemoglobin. Thus an oligochromemia is more pronounced than an oligocythemia. In the phases of regeneration, the blood changes characteristic of the phenomenon are anisocytosis, polychromatophilia, normoblasts, and reticulocytes. An examination of the white blood cells in

anemic and non-anemic pigs did not show any particular differences. In both groups, however, we observed that the total number of this type of cell decreased the first few weeks after birth and, by the time the pigs were ten to twelve weeks of age, the number usually was greater than at birth. The average number of white blood cells per cmm at birth was about 12,000; at four weeks of age 9,000; and ten weeks 16,000.

CONCLUSIONS

1. A disease marked by blood changes characteristic of a simple or secondary anemia develops in suckling pigs that are raised under conditions which prevent them from ingesting soil.

2. Suckling pigs which have an opportunity to ingest soil, beginning early in their life, do not suffer any of the rigors incident to this disease.

3. The disease is primarily one of nursing, suckling or babyhood age and occurs some time during the second to sixth week of life.

4. Under natural conditions, especially in regions north of 40° N. Lat., the disease is more prevalent in the late winter and early spring seasons of the year. This, we believe, is because the early farrowed pigs must be confined indoors, to shelter them from the inclement climatic conditions such as would be unfavorable to newborn and baby pigs.

5. Spontaneous recovery from the disease is not uncommon, although the pigs may still be living under the conditions favorable to its development. Spontaneous recovery begins shortly after the pigs begin to take cereal food. In point of time, this is usually about the fifth to seventh week after birth.

6. The ultimate cause of anemia in suckling pigs is a deficiency of iron in their diet. This conclusion is reached from the fact that the syndrome characterizing the disease did not develop when iron was administered to suckling pigs in amounts equal to four or five milligrams per kilo body weight.

7. While we have no definite knowledge with regard to what element or elements of the soil contributed to its value as a preventive of anemia in suckling pigs, we presume it was the iron.

8. The blood-picture characterizing this disease in suckling pigs resembles the blood-picture of the infantile type of chlorosis in humans.

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Wild Ducks Develop Their Own Routes

In flying from their wintering grounds in the southern part of the United States to their breeding grounds in Canada, wild ducks use the same routes as those used by their ancestors. The birds, through the ages, have developed their main routes of travel into four main systems, according to F. C. Lincoln, naturalist of the U. S. Biological Survey. From north to south, the migration routes come together in four definite geographic regions, called flyways, which have been designated the Atantic, the Mississippi, the Central and the Pacific. For practical purposes, the duck flyways are as separate as if they had been fenced off by mile-high woven wire. Three families of ducks may nest in the same marsh in northern Canada, but when the southward migration starts the three groups will not fly together, but both the old and the young ducks will go south by the same routes that the parents flew in going north.

Seven Out—Seven In

The Texas State Board of Veterinary Medical Examiners recently underwent a complete change of personnel, when the seven men who had composed the Board concluded their terms of office and seven new men were appointed in their places. Those named by the Governor of Texas to conduct the veterinary medical examinations are: President, Dr. Fritz A. Murray, Austin; vice-president, Dr. A. C. Burns, Cleburne; secretary-treasurer, Dr. L. J. Lauraine, Gonzales; Dr. Paul P. Borinski, Jr., Port Arthur; Dr. P. P. Starr, Gainesville; Dr. Archie Stallings, Houston, and Dr. O. E. Wolf, Big Springs. The members of the Board will serve for a term of two years, or until their successors are selected and duly qualified. The personnel of the Texas Board is the largest of any state veterinary examining board in the country. Five seems to be the most popular number, 17 boards having this number of members.

A SERUM REACTION OBSERVED IN ANAPLASMOSIS*

Preliminary Report

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In the course of experiments to develop a test which would be an accurate and inexpensive method of detecting Anaplasma carriers, repeated attempts based on the principles of complement-fixation and precipitation were unsuccessful.

At the suggestion of Dr. Edward Records, of the University of Nevada, that the mercuric chloride test might be applicable to anaplasmosis, the technic used by Fulton[1] on swamp fever was followed at this laboratory. In sera from cattle having no history of Anaplasma infection, both the tubes containing the mercuric chloride dilution and the control tube containing the distilled water remained clear; in sera from known cases of anaplasmosis, just as distinctly positive reactions were obtained in the tubes containing the water controls as in those containing the mercuric chloride dilutions. This being the case, water was the simpler medium for the test.

The technic for obtaining the serum is, with slight modifications, the same as that described by Bennett[2] and later by Fulton.[6] Blood is drawn and allowed to stand at room temperature until the clot is formed. The serum may be used immediately but usually is kept overnight. In one instance phenolized serum, preserved for two months at ice-box temperature, still gave a good positive reaction. If centrifugalization is necessary to separate the serum, a moderate rate of speed is advocated.

To perform the test, 2 cc of distilled water is placed in a small test-tube, two drops of serum are then dropped directly into the water and the tube is shaken at once to mix the serum and water thoroughly.

If the animal is recovering from anaplasmosis or is a recently-recovered carrier, cloudiness appears promptly in the serum-water mixture. This cloudiness may not reach its full density until after it has stood for a few minutes. A reaction is called positive if, after allowing the tubes to stand for twelve or more hours, the cloudy precipitate settles out and forms a white blanket over the bottom of the tube. If the contents of the tube remain prac-

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ically water clear or but slightly cloudy and if, upon standing, no precipitate settles down, the reaction is considered negative.

The results of this serum-water test on various groups of animals are summed up in table I.

TABLE I—*Results of the serum-water test.*

Separate cow sera tested	197
Positive reactions (total)	56
Known infected or carrier sera	13
Positive reactions	13
Suspected but not definitely proved carriers	1*
Positive reaction	1
Sera from "H" herd in which anaplasmosis was known to have present	10
Positive reactions	7
Sera from "T" herd in which anaplasmosis was known to have been present	88
Positive reactions	26
Sera from miscellaneous animals or herds in which anaplasmosis was suspected to be present	5
Positive reaction	1
Sera from animals inoculated with ground spinose ear ticks, *Otobius (Ornithodorus) megnini*, removed from a cow suffering from anaplasmosis	2†
Positive reaction	1
Sera from Texas fever carriers (sent by Dr. L. Leonpacher, of Louisiana)	9
Positive reactions	5‡
Sera from tuberculin reactors	5
Positive reactions	0
Sera from *Brucella abortus* reactors	10
Positive reactions	0
Sera from Tritrichomonas-infected cattle	6
Positive reaction	1§
Sera from cattle hyperimmunized against anthrax	9
Positive reactions	0
Positive reactions accounted for (total)	55

*A field case with blood-picture showing the characteristic blood-changes but no marginal bodies.

†Both animals proved susceptible to experimental infection later.

‡Whether or not these animals carried Anaplasma as well as *B. bigemina* is not known.

§History unknown.

The remaining positive serum, unaccounted for in table I, was from a cow in the experiment herd, which had never been artificially infected with Anaplasma, had no history of Anaplasma infection, and was not proved to be a carrier when its blood, inoculated into a susceptible animal, failed to produce the disease.

The evidence supplied in table I tends to indicate that, in comparison with the other diseases mentioned except Texas fever, the reaction is peculiar to Anaplasma infection.

The principle upon which this test is based is probably the precipitation of euglobulin in higher aqueous dilution. The euglobulin appears to increase during the course of the disease, as demonstrated in table II; the pseudoglobulin however, if it shows change, seems to decrease slightly. These findings seem to parallel those of Horgan and Bennett.[3]

TABLE II—*Changes in the globulin fractions with the appearance of the serum-water reaction (cow 140*).*

SERUM-WATER TEST	EUGLOBULIN†	PSEUDOGLOBULIN†
Negative (−)	1.30‡	1.56‡
Positive (+)	2.19‡	1.56‡
Strongly positive (++)	2.82‡	1.52‡

*This cow was an experimental case. Globulin estimations and serum-water tests were carried out every few days from the time the marginal bodies were first observed until the animal was well on the way to recovery.
†Greenberg method.
‡Average of several determinations.

In spite of the tendency of the euglobulin to increase during the course of anaplasmosis, the reaction apparently does not depend on quantity alone. In general, the euglobulin content of normal animals and of animals infected with maladies other than anaplasmosis, both of which reacted negatively to the serum-water test, was as large as that of Anaplasma-infected beasts. This point is illustrated in table III.

The first appearance of the reaction does not coincide with the first appearance of the marginal bodies characteristic of anaplasmosis. A period of about two weeks elapses between the observation of the first few bodies and the first definitely positive serum-water reaction. Occasionally, animals die before their serum reaction becomes genuinely positive. As the disease runs its course, the reaction grows much stronger. However, it is not very persistent, tending to disappear after a very few months. What effect treatment of the malady may have on the reaction is not yet clear.

Although the exact explanation of this reaction is unknown, the reaction itself has been observed previously. Bramachari[4] has applied it to kala azar, Horgan and Bennett[3] have observed it in trypanosomiasis in camels, and possibly other investigators have noted it in other diseases. No claims can, therefore, be made for its specificity. The results of very limited trials with sera from recovered cases of Texas fever would suggest that the reaction may be observed in that disease, but proof that the

TABLE III—*Comparison of the euglobulin content of carrier and other sera.*

Cow	Euglobulin*	Serum-Water Test	Remarks
2609	3.54 g	−	Normal group
2637	3.41 g	−	
2650	3.29 g	−	
2651	3.07 g	−	
039	3.68 g	−	Group infected with *Brucella abortus*
097	4.07 g	−	
3506	4.62 g	−	
3686	3.65 g	−	
B111	1.53 g	−	Group infected with *Tritrichomonas fetus*
258	0.46 g	+	
395	0.87 g	−	
1109	0.72 g	−	
1114	0.37 g	−	
5989	1.12 g	−	
1	3.54 g	++	Group of animals from "H" herd in which anaplasmosis is known to have been present
4	3.83 g	+	
6	2.68 g	++	
10	2.42 g	++	
15823	4.00 g	+	Group of animals from "T" herd in which anaplasmosis is known to have been present
17451	2.57 g	+	
17473	1.14 g	+	
C81950	4.53 g	+	
11	3.06 g†	+	Group of experiment animals artificially infected with *Anaplasma marginale*
140	2.42 g†	+ to ++	
141	4.68 g	++	
1051	2.40 g†	+	
1255	2.93 g†	+	
1719	5.04 g	++	
2059	3.38 g†	+	
2603	2.02 g	+	

*This was determined in some cases by the Greenberg method, and in others by the micro-Kjeldahl method.

†These figures are averages of several determinations.

cattle tested were free from Anaplasma is lacking. In comparison with some bacterial infections, however, the test does appear to be rather specific for anaplasmosis.

At present, the only value claimed for the serum-water test is that it seems to substantiate the clinical and microscopical findings in the more chronic cases of anaplasmosis, and to be of some diagnostic importance in newly-recovered carriers, whose blood appears to be free from Anaplasma.

ACKNOWLEDGMENT

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Oklahoma Has 195 Registered Stallions

Of the 195 stallions registered in 1934 with the State Livestock Registry Board of Oklahoma, 174 were Percherons; nine were Belgians; six were Thoroughbreds; three were American Saddle Stallions, and one each was French Draft, Morgan and Standardbred, according to records of the Board.

Reciprocity with Canada

Cattle from modified accredited areas in Canada will be admitted to the United States, after August 1, 1935, without further tuberculin-testing, according to a new reciprocal agreement recently issued as a part of Order 352 of the U. S. Bureau of Animal Industry. The United States has been admitting cattle from accredited herds in Canada without further test. The new order is an extension of the procedure to areas in which all cattle have been tuberculin-tested and in which the extent of the disease has been found to be less than one-half of 1 per cent.

The new plan was suggested to veterinary officials of the U. S. Department of Agriculture by Dr. George Hilton, Veterinary Director General, Health of Animals Branch of the Canadian Department of Agriculture. The plan will facilitate movement of cattle in both directions across the United States-Canadian boundary for breeding purposes and herd improvement.

The procedure places the movement of cattle across the border on essentially the same basis as the movement of cattle among the states. The two countries have been working to eradicate tuberculosis among cattle along virtually identical lines. As a safeguard against the introduction of other communicable diseases, the customary requirement of a general health certificate is being continued.

FIFTY FRUITFUL YEARS IN VETERINARY SCIENCE*

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Mr. Toastmaster, fellow alumni, and friends: In acknowledging the invitation of my good friend and your efficient secretary, Dr. Booth, to meet with you on this occasion, I did so with unusual pleasure. The carrier pigeon is regarded as having the homing instinct developed in highest degree, but I have observed the same inclination conspicuously present in other animals, including man himself. The layman expresses it as a tug on the heartstrings and the force is often a powerful one. I have responded to this force tonight and it is highly gratifying to be able to visit my Alma Mater on this memorable occasion.

I look upon this institution as the cradle of veterinary learning in the United States, not because it was the first to enter the field but rather because of its early leadership in veterinary education and scientific undertaking. It has been my good fortune to have been connected with several educational institutions either as a student or teacher. In no instance have I contacted in any one institution such a triumvirate of educators as Pearson, the indefatigable leader; Adams, the genial fundamentalist; Harger, the methodical analyst. Of the veterinary staff while I was a student, only two survive. I am glad to see one of them, Dr. Glass, with us this evening and I am sure the other, Dr. Formad, at his home in Virginia, is present in spirit.

In selecting as a topic for discussion, "Fifty Fruitful Years in Veterinary Science," I realized the futility of offering to an audience, such as this, any new information. I have also anticipated that previous speakers would cover the historical events from the days of Huidekoper to the present. Rather than proceed along this line, I feel that possibly you may be more interested in a brief résumé of general veterinary achievements, not so much from a technical standpoint, as with regard to their social and economic values.

You will recall perhaps that when the Austrian monk, Gregor Mendel, in 1865, announced certain discoveries concerning the biological mechanism of heredity, his researches did not impress contemporary workers or the public in general. Mendel died in 1884 without himself realizing the importance to humanity of the work which he had done. Yet 35 years after Mendel's dis-

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covery and about 16 years after his death, other investigators working independently rediscovered Mendel's achievement and its value to civilization. The application of Mendel's law has been largely responsible for subsequent progress in the improvement and development of animal and plant life.

I have noted at times certain comparisons between the value of pure science and that of applied science. Frankly, I have slight patience with attempts to compare two such dissimilar values. Both are necessary and deserve our full support, but I look upon pure science—Mendel's law, for instance—as the seed, whereas its application is the useful fruit developed from that seed.

Conquest over Fear

Let us now consider and appraise, with that analogy in mind, a few of the more specific results of veterinary science during the last half-century. One of the most conspicuous is the conquest over fear that once was engendered by the plagues that ravaged domestic herds and flocks. Man is a hopeful creature. Perhaps it is fortunate that we are able to put away and forget the fears, worries, and problems of the past which no longer concern us. Yet 50 years ago, bloody murrain, as tick fever was called in those days, was playing a vampire rôle in the South. It was striking down thousands of head of live stock annually and reducing many more to an unthrifty, stunted condition. Not only that, but farmers in the central and northern belts of latitude were becoming alarmed when attempts of southern cattle-owners to trail their stock northward caused the spread of this mysterious disease. In other areas stockmen found that cattle, horses, and sheep were "growing crazy," so to speak, and the cause was a mystery. Hog cholera also was rampant and in some areas struck so hard and so repeatedly that attempts to raise hogs to marketing condition appeared hopeless. On the western ranges sheep became sick and unthrifty, many dying from unknown causes.

Against these seemingly ghost-like attacks directed at their domestic animals, stockmen were helpless. The knowledge of a lifetime in handling live stock could not solve the problems and even the most wealthy stockmen found that money, as such, could not buy the answers that would bring relief.

About that time the veterinary profession, as my older colleagues well recall, assembled a small band of valiant warriors and waged a scientific battle of Thermopylae. They were a pitiably small and ill-equipped group against a host of enemies. Yet they found the vulnerable spots in the armor of pleuropneu-

monia, tick fever, hog cholera, forage poisoning, and a host of other diseases, bacterial and parasitic. I might elaborate on the stalwart men who were in the thick of the fight, but their names are already well known to you. Largely through the efforts of those capable men and their associates in advancing the banners of veterinary science, fear of animal maladies began to disappear. With the passing of time it has been replaced by a broad confidence in veterinary science. This confidence is now to be found not only among stockmen but also among many leaders of industries in metropolitan centers, state legislatures, and in the halls of Congress.

Contributions to Public Health

Closely akin to the conquest over fear and its replacement by confidence is the contribution of veterinary science to public health. This service has had many forms of expression. The most conspicuous perhaps is federal meat inspection. Fifty years ago, there was virtually no protective supervision of this kind. Twenty-nine years ago, in 1906, when the present form of meat inspection was established by act of Congress, approximately half the animals slaughtered came under official veterinary supervision. Today the corresponding proportion is estimated to be about two-thirds. Translated into actual veterinary operations, these figures mean that upwards of 75 million animals, slaughtered annually, and their carcasses now receive a thorough veterinary inspection.

A further major contribution to public health has occurred in the eradication of bovine tuberculosis. Current medical information reveals conclusively a decrease in certain human forms of tuberculosis that can be traced to bovine sources. In your own state of Pennsylvania, the death-rate from all forms of tuberculosis other than pulmonary has been reduced more than one-half within the last decade alone. Medical authorities attribute this achievement in some measure at least to the elimination of tuberculous dairy cattle. In March, 1892, Dr. Leonard Pearson held a public postmortem demonstration which confirmed the results of tuberculin tests he had previously administered. This event appears to have been the beginning of tuberculin testing in the United States, now being conducted at the rate of more than two million tests a month. Two days ago, Pennsylvania completed the first tuberculin test of all cattle within its boundaries and in the very near future this state will become a modified accredited area.

Likewise in the study and control of rabies, this veterinary institution has performed outstanding achievements which contribute to the public health and safety. Veterinary science has contributed also to the suppression of many parasitic diseases, including those endangering human health. The conquest over yellow fever, trichinosis, hookworm disease, and the like are familiar examples. In addition, veterinary supervision of animals from which numerous drugs and biologics are derived contributes additional benefit to public health.

Improved Economic Stability

A third fruit of veterinary science is improved economic stability. Possibly you may consider this particular fruit to be out of season. Yet even frankly recognizing the present extent of economic unrest, I hold that veterinary science has exerted a steadying influence toward keeping the Ship of State on an even keel while sailing tempestuous economic seas. The Bureau of Animal Industry has coöperated closely with various official adjustment and relief agencies. Last summer, for instance, portions of the southern states from which ticks had been eradicated provided pasturage and a safe haven for millions of cattle that had been starved out of the drouth areas. This vast salvage movement was possible only because of previous veterinary research and its application in the form of tick eradication. The federal inspection of meats for the Civilian Conservation Camps and various relief organizations has been a noteworthy veterinary function. But more important probably than these special services are the former contributions of research to practices of breeding, feeding and management.

Beginning with the selection of sound, healthy breeding stock and continuing through the proper nutrition of the offspring and procedures for safeguarding the young animals throughout their development, veterinary science has removed many uncertainties that formerly existed. The hog-raiser, for instance, who uses the system of swine sanitation, operates under a more substantial economic system than was possible before research provided this protection. Ability to control stomach worms, scab mites, and other parasites and maladies of sheep has placed the production of the ovine species on a more secure basis. Other veterinary contributions to efficiency in raising and marketing all kinds of live stock have reduced costly losses that formerly occurred.

There are still, of course, risks incident to weather and other forces entirely or in part beyond human control; yet veterinary science has overcome scores of risks that formerly prevailed.

And it has thereby contributed substantially to the economic status of producers and to an ample and continuous supply of food and other animal products for consumers. As a further illustration, let me cite briefly an incident reported from a western town. A notorious bad man had been killed. There was a large funeral, but when the attending minister asked whether any one would like to speak a word of eulogy for the departed, his invitation was followed by an embarrassing silence. Finally, a grizzled rancher cleared his throat and remarked, "I just want to say that Pete wasn't always so bad as he was sometimes." Thus, even granting that the depression has been the most serious in current history, veterinary science has exerted a tempering effect. Without the helpful services rendered, economic distress would have been even more oppressive.

Humane Treatment of Animals

As a fourth fruit of veterinary science worthy of comment let us consider the humane treatment of our domestic animals. In some respects the advancement of civilization is associated with the gradual abandonment of barbarities, intentional or otherwise. Though revolting instances still occur, they are isolated and quite unrelated to the public spectacles in the Coliseum of ancient Rome, or the barbarities of earlier times with their human sacrifices and the slaughter even of infants at the behest of tyrants. There is abundant evidence to show that man has mellowed and become kindlier, and this fortunate trend of our civilization is reflected in consideration for the lower animals.

Witness the laws and regulations which have brought about improved conditions in transporting animals both on sea-going vessels and by rail to public markets. In veterinary surgery, animals now have the advantage of local and general anesthetics and hospital equipment broadly comparable to facilities used in human surgery. Medicinal treatments also are more effective and humane, generally speaking, than a half-century ago. The frequent use of irritants, for instance salt and turpentine in open wounds by misguided laymen, has given away to competent, considerate, and humane veterinary treatment. This fortunate trend has brought many economic benefits as well as a great reduction in suffering and misery.

Personally, I value greatly the privilege of being a member of a profession which has so ably reduced suffering among sentient domestic animals. This is perhaps one of the sweetest fruits of veterinary science.

Industrial Development

Still another product of our profession, noteworthy in this practical era, is industrial development. A few examples will suffice, for the evidence is all about us. The manufacture of anti-hog cholera serum and other biologics had its origin in veterinary research and from a small beginning has become an industry of noteworthy importance, having its conferences and codes and other signs of industrial maturity. The manufacture of numerous dips and disinfectants is an outgrowth also of similar study. The same is true of much of the sanitary equipment used in dairy and meat-packing establishments and of the more closely related products of veterinary supply houses.

In certain cases, industry has followed in the footsteps of the veterinarian, such as in the South where creameries and ice-cream factories have sprung up soon after the eradication of cattle ticks. You can supplement these examples at will from personal observation and experience.

International Understanding

I wish now to discuss a different type of fruit, probably the choicest of all as well as the most difficult to bring to ripe maturity. I refer to world understanding and peace. Possibly you may not agree with my optimistic views on this subject, seemingly apart from veterinary science. In the face of evidence to the contrary, I hold that within the last 50 years there has been material progress in the direction of world understanding and friendship among nations, and that veterinary science has contributed to such progress. True, the period in question has witnessed the most violent war in all history, as well as lesser conflicts. But, nevertheless, there is evidence of an increasing desire among the populations of the world to live at peace with one another. Through improved and more rapid means of travel and communication, the nations now see each other's problems at closer range and have greater tolerance with different points of view.

The twelve International Veterinary Congresses have been marked by zeal among the delegates to concentrate energies more fully against adverse natural forces, such as diseases, and to bring about true coöperation among the nations. The first International Veterinary Congress antedated the League of Nations, and from personal observations at recent congresses I am confident that the courtesies and pledges of international coöperation have been sincere. The work of the committees, looking toward future coöperation, has been based on scientific

principles rather than on transient considerations. The statesmanship evident at the veterinary congresses has been scientific statesmanship. As such it has been fundamentally sound and has in general received the support of the countries whose welfare and interests are represented.

There have been other strong evidences of international cooperation and friendship. Foreign veterinarians and research workers have learned that they are welcome in the United States and, in reciprocating measure, veterinarians of this country have not only studied abroad but carried on experimental work there. The foot-and-mouth disease commission of the United States Department of Agriculture, which spent a year in Europe, received the utmost assistance from foreign investigators and officials. Leaders in veterinary science commonly formulate or act as consultants in the preparation of regulations which affect world commerce in animals and related products.

Within a few months, copies of the proceedings of the Twelfth International Veterinary Congress, held last August in New York City, will be distributed to all the nations represented. The papers and discussions will fill three volumes containing the latest knowledge dealing with the welfare of animal life and the highest degree of protection to the public through veterinary supervision of meat and milk supplies. Each of these volumes is essentially an emissary of good will. And, as an American, I am proud to state that these helpful documents will carry the seal of the United States Government.

Other Fruits of Veterinary Science

Besides the more conspicuous fruits of veterinary science already discussed, there are others which I shall mention only briefly.

Standards of veterinary education have improved materially. Longer and more thorough courses of study than formerly are needed to familiarize students with the increasing quantity of veterinary knowledge.

The enactment and enforcement of sound and effective live stock laws are the outgrowth of veterinary science. It is common knowledge also that the live stock laws, practically all of which have a scientific foundation, have been very well sustained in the courts and by public opinion.

The recognition which the work of veterinarians has received from other professional groups is a further noteworthy fruit of the last half-century.

The experience of the last 50 years has proved also the effectiveness of coöperation in veterinary enterprises for professional

advancement and public welfare. The principles of true coöperation, as an element in industry and government, find much foundation material and support in the success of stock-owners, veterinarians, and public officials, working together harmoniously toward common objectives. This type of coöperation, for example, resulted recently in the tuberculin-testing of all the cattle in an entire county in Oklahoma in less than six days. Through good organization and united effort, tests were applied to 26,000 cattle in more than 3,000 herds within the time stated.

Some Fruits Yet to Ripen

Because of the unfailing interest of the human species in the future, these remarks naturally lead to a few comments on that subject. There is still much necessary and useful work to do. Judging from the past, I anticipate that veterinary science will bring about the maturity and ripening of other fruits that are now in early formative stages. In my judgment there are many undeveloped opportunities for the veterinary profession to occupy spheres of increased usefulness, especially along economic and social lines.

You already are familiar with the development of federal meat inspection, during the last half-century, to the point where about 67 per cent of meats receive veterinary supervision. From both a veterinary and human-health standpoint, 67 per cent is not the logical stopping-place. In Italy and Belgium, for example, the veterinary inspection of meats extends also to small towns and rural districts. Probably in the United States the time has not yet arrived for veterinary supervision of the remaining 33 per cent of the meat supply. I recall, however, that the United States mail service was developed first among the principal cities and only within the last half-century has extensive rural delivery been established. The two cases in question appear to be somewhat parallel. Inspection of 67 per cent of the total slaughter represents good progress, but 100 per cent should be the goal.

The principles of life insurance, widely recognized as a distinct social and economic asset, have already been extended on a small scale to animals, especially those of considerable value. Here is a subject that concerns the veterinary profession and that seems to offer noteworthy possibilities for study and development. In this connection statistical information on most animal maladies is still fragmentary. Estimates, frequently little better than guesswork, appear to overshadow dependable data. The records of federal meat inspection provide the roots and trunk of the statistical tree, but the branches are few and the fruit is still very much undeveloped.

Turning to the sporting field, we find intense public interest in the soundness and stamina of racing stock and in the integrity with which race-track events are conducted. When the best horse wins, the event is true sport, but when the result of the race is affected by unethical treatment or improper interference with an animal's normal faculties and functions, the event becomes a degrading, dishonest spectacle. Probably persons interested in clean sport would welcome closer and more complete veterinary supervision of racing stock and this form of competition generally. Present technic, such as the saliva test, makes possible the detection of several drugs likely to be used. The same principle of veterinary control, directed along different lines, applies to the fitting of animals, and I wish especially to include dogs, exhibited at various shows.

As to the manner of bringing these and related fruits to maturity, a basic need is greater public appreciation of the services that veterinarians are prepared to render. We appear to have produced veterinary knowledge faster than we have distributed it. The federal Bureau of Animal Industry, as well as the Veterinary Department of the University of Pennsylvania, has also recently passed its fiftieth anniversary, and we find that some of our work is still unfamiliar to many persons who are intensely interested when it is explained.

A few years ago, a young Bureau veterinarian was assigned to hog-cholera work in a certain state. He was a new man on a project that had been going forward for about five years in a group of counties. Shortly after entering on his duties, he called on the editor of a country newspaper to request that an item be published concerning a forthcoming meeting. The editor was cordial but somewhat surprised.

"How long has this work been going on around here?" he asked. Our veterinarian informed him that it had been in progress for several years. "I never heard of it," the editor exploded, "tell me about it." After the veterinarian explained the purpose and value of the project, the editor said, "I'd like to have a special article on this project each week for the next ten weeks." The article was prepared and printed. The paper also carried an account of every important meeting on the subject held in the locality. When a Bureau veterinarian met a farmer, introductions were scarcely necessary. The farmer knew about the work and about the veterinarians who were conducting it. The project prospered and hog cholera practically disappeared from that area.

This example illustrates in a small way the helpful influence of public opinion. Veterinary science, though developed and administered by professionally trained workers, has a great many features of interest to stock-owners and the general public. Some veterinarians are able writers and speakers and utilize favorable opportunities in these fields. Let us also be generous in sharing this informational field with properly qualified friends in other walks of life. A capable newspaper reporter, special writer, or public speaker may not be adept in using our scientific diction or laboratory dialect, but he probably can give a social and economic direction to scientific facts better than most members of the profession itself.

There are other opportunities also through committees of veterinary organizations and personal contacts between members of our profession on the one hand, and civil, industrial and political leaders on the other.

Though still young, veterinary science is now ready to take its place more fully in industrial and economic councils and in national and world affairs. Thus, while still continuing technical studies, let us give thought also to sharing professional achievements with the public broadly. Veterinary knowledge and experience have potential uses in helping to straighten out the tangled skein of human affairs.

Thus as principal fruits of the past we may consider with pardonable pride:

1. A successful conquest over fear.
2. Contributions to public health.
3. Improved economic stability.
4. Humane treatment of animals.
5. Industrial development.
6. A better international understanding looking toward world peace.

In the future, let us continue to cultivate and develop those and related fruits, giving them, if possible, a wider distribution so that all people may derive benefit and enjoyment from partaking of them.

Flea Industry Put Out of Business

The proprietor of a flea circus in England was recently prosecuted by the R. S. P. C. A., for having kept several Yorkshire terriers in an emaciated condition for the purpose of breeding fleas for his circus. He was fined for cruelty, for keeping dogs without licenses and was disqualified for keeping dogs for five years.

SPONTANEOUS HYDRONEPHROSIS IN THE DOG, WITH OSTEOID TISSUE IN THE RENAL PELVIS*

By CARL OLSON, JR., *Rochester, Minn.*
The Mayo Foundation

Spontaneous hydronephrosis in the dog is not a common pathologic finding. Henschen[1] mentioned four cases that were previously described in the literature. In the case reported by Siedamgrotzky, hydronephrosis was caused by complete obliteration of the terminal portion of the ureter; in Almy's case, hydronephrosis was traumatic in origin, and in the other two cases, which were described by Joest, hydronephrosis was caused by occlusion of the ureteral opening by carcinoma of the urinary bladder. Underwood[2] described a case of spontaneous hydronephrosis in a dog resulting from obstruction of a ureter by calculus. Leighton[3] reported a case of spontaneous hydronephrosis in a dog, the etiology of which was unknown; in this case the other kidney was absent. Wigdor[4] also mentioned having observed spontaneous hydronephrosis in a dog.

Hydronephrosis results from an impediment to the flow of urine from the renal pelvis. Most textbooks of pathology state that such obstruction is partial, continuous, or periodic in its effect on urinary outflow. Experimental hydronephrosis in the dog is, however, brought about by sudden and complete occlusion of the ureter.[5]

Among the pathologic alterations causing an obstruction that may lead to hydronephrosis are: strictures of the ureter or urethra; neoplasms of the urinary tract; congenital atresia or valvular malformations of the ureters; aberrant renal arteries, or movable kidneys which cause kinking of the ureters; displacement of the kidney or ureter by external pressure from neoplasms; the pregnant uterus, or in ruminants, the filled rumen; and calculi.

The anatomic relationship of the ureters and urinary bladder in swine is an explanation of the fact that spontaneous hydro-

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nephrosis is more common in these than in other domesticated animals.[1] The ureters of swine open into the bladder rather far posteriorly and ventrally, and in some the ureters extend so far in this manner that when the urinary bladder is partially filled, the ureters become compressed between the bladder and the brim of the pubis.

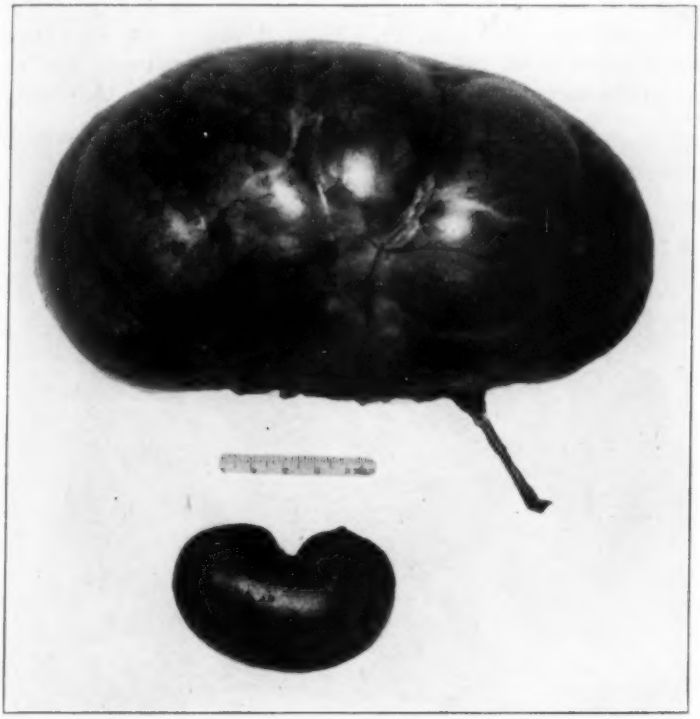

FIG. 1. The right and left kidneys of a dog; the right kidney is of normal size and shape. The general appearance of the hydronephrotic left kidney and the normal appearance of the ureter at its lower pole will be noted.

In addition to the causes just listed, bilateral hydronephrosis in man is commonly due to prostatic hypertrophy, and sometimes to paralysis of the bladder from lesions in the spinal cord (Bell[6]).

REPORT OF CASE

In view of the fact that there are few reports in the literature of spontaneous hydronephrosis in the dog, it seemed worth while to record the observations in this case. The case was of further interest because of the unusual character of the cellular reaction in the renal pelvis.

The dog was an adult male mongrel that weighed 18 kg. The animal was anesthetized with ether and bled to death. On opening the abdomen, a large sac-like mass was found in the region normally occupied by the left kidney. This mass was roughly bean-shaped and measured 20 by 20 by 10 cm, and the visceral peritoneum was reflected over it. The smooth surface was broken by shallow indentations, giving the structure the appearance of being slightly lobulated (fig. 1). The left ureter was of normal size, and arose from the bladder in the usual manner and extended to the saccular structure. A probe passed into this ureter

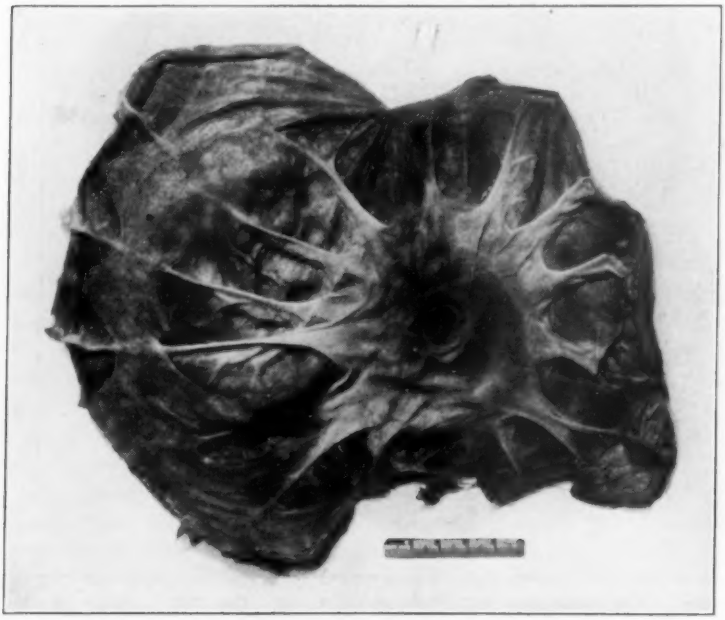

FIG. 2. Interior of the hydronephrotic kidney; the plaque of osteoid tissue may be observed in the center of the pelvis.

through the vesical orifice met an obstruction at the lower pole of the kidney. On careful dissection it was found that the end of the ureter was imbedded in loose areolar tissue and that there was no apparent direct connection with the pelvis of the kidney. The left renal artery and vein were in their usual positions.

The right kidney and ureter were normal, this kidney weighing 53 gm (fig. 1). On subsequent histologic examination it proved to be normal. No gross pathologic changes were observed in other organs.

The hydronephrotic kidney, on the other hand, weighed 1,200 gm and contained approximately 1,100 cc of a turbid, yellow-brown fluid. Microscopic examination of this fluid revealed a few crenated erythrocytes. The fluid had been contained in a single, large, thin-walled sac which represented a tremendously dilated renal pelvis (fig. 2). Eight calices were demonstrable. A hard plaque-like structure, 13 mm in diameter, was present in the pelvis at about the site where the ureteral orifice should have normally been.

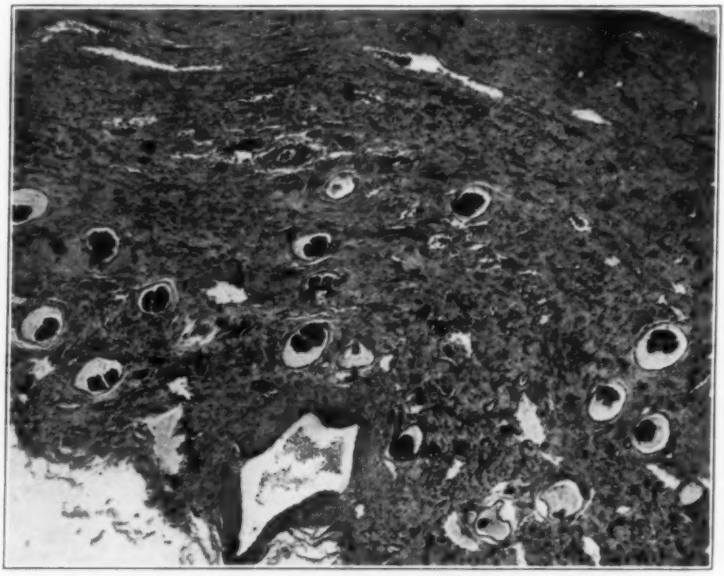

FIG. 3. Section through the wall of the hydronephrotic sac. There is an atrophy and replacement of the parenchyma with connective tissue and the tubules and glomerular spaces are dilated.

Histologically, a few glomeruli in various stages of atrophy were observed. In many of these the glomerular space was distended with a pink homogeneous substance; many of the tubules were also distended. The parenchyma of the kidney was greatly atrophied and was reduced to the thickness of the wall of the hydronephrotic sac (fig. 3).

Histologic examination of the plaque-like structure revealed curious changes in this region. Immediately under the lining epithelium was a thin layer of osteoid tissue (fig. 4). In the center of the plaque was a small protuberance within which was

a cavity lined with cuboidal epithelium similar to that lining the pelvis (fig. 5). This lining epithelium was surrounded by a thin layer of osteoid tissue. Lacunae in the osteoid tissue were occupied by osteoblasts. In only one area was there an appreciable amount of calcium deposited in the bone-like substance. The fact that the tissue did not require decalcification before histologic section also indicates the lack of any considerable amount of mineral salts. The tissue around the cavity in the protuberance was composed of fibroblastic elements, many blood spaces and blood-vessels, and spicules of bone and cells which appeared

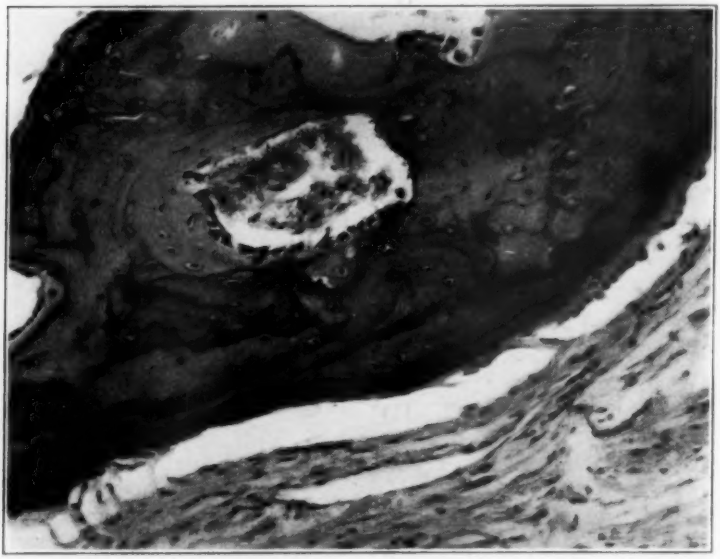

FIG. 4. A more magnified view of the osteoid tissue, showing its general characteristics (x 190). This area is indicated by a square in figure 5.

similar to reticular cells filled with hemosiderin. When stained by Mallory's method (potassium ferrocyanide and hydrochloric acid) for the demonstration of iron, the material within these cells gave the typical blue reaction indicative of iron. There was no evidence of previous infection at the time of necropsy.

COMMENT

The cause of spontaneous hydronephrosis in this case is somewhat obscure. Unquestionably the site of the primary disturbance was at or near the origin of the ureter from the renal pelvis.

Possible etiologic factors are congenital valvular malformations or stricture of the ureter at its origin from the pelvis. Cases of these types of congenital hydronephrosis in man are discussed by Gruber.[7] In the case reported here, the disappearance of the initial portion of the ureter may be evidence indicating some such congenital malformation, which had eventually become atrophic.

The bony plaque-like structure in the pelvis of the kidney may have had its origin by transformation of the subepithelial connective tissue elements into osteoblastic cells. Such a transformation has been known to occur in the connective tissues of the lung[8] and in chronic thyroiditis (*struma ossea*).[9] Fischer men-

FIG. 5. Cross-section of the bony plaque, showing general distribution of osteoid tissue (x 8.5).

tioned observing tumor-like, extramedullary, subpleural foci of bone-marrow tissue in the lung of a woman, 70 years of age, who had died of carcinoma of the stomach.

Huggins,[10] and later Abbott and Goodwin,[11] studied experimentally the formation of bone in the rectus fascia of the dog by transplantations of epithelium of the urinary tract to this site. Huggins found that there apparently was a direct influence of certain epithelial cells (those of the renal pelvis, ureter, and vesical mucosa) on the connective tissue cells that stimulated formation of bone at the site of transplantation. This influence of stimulating bone formation was observed to be associated with regeneration of the epithelial cells and the formation of cysts lined with regenerated epithelium. It would seem possible that in this case the initial lesion giving rise to the occlusion

of the ureter was followed by regeneration of epithelium, and that the cavity observed within the bony plaque represents such a cyst, as was observed by Huggins and Abbott and Goodwin, which preceded the formation of the osteoid tissue.

While a detailed microscopic description was not given, it is of interest that Leighton mentioned "a disseminated gritty deposit" in the pelvic wall of the hydronephrotic kidney observed by him. Wigdor described a "bony pelvic structure" in the case of spontaneous hydronephrosis he observed.

The possibility of osteoid tissue being formed as a result of displacement of embryonic renal cells must be considered. The multipotency of the embryonic renal cells is the usually accepted explanation for the presence of cartilage and bone is embryonal nephroma (Feldman[12]).

Summary and Conclusions

A case of unilateral hydronephrosis in a dog was studied and the observations in the case discussed. A peculiar osteoid connective-tissue reaction was found in the wall of the pelvis at the site where the ureter normally has its opening. Continuity between the ureter and renal pelvis was not present, as a portion of the ureter had evidently atrophied. The cause of the hydronephrosis and of the unusual formation of bone which occurred could not be determined.

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MONSTROSITIES*

By WM. R. KERMEN, *Los Angeles, Calif.*

HISTORICAL

The designation "monstrosity" is generally applied to a creature which exhibits some vice in conformation, as in form or structure of one or more parts of the body. There may be a deficiency in one or more limbs, the head, part of the head or trunk, or fusion of one or more individuals. In ancient times the appearance of monstrosities was ascribed to the influence of enraged gods, and they were regarded with fear or horror; or they were looked upon as prodigies or freaks of nature, and described as marvels or curiosities.

Now, it is thought that the majority of the malformations due to defects in higher animals represent in a more or less perfect manner the normal conformation of the inferior classes. For instance, the imperfection or absence of limbs is the natural condition of fishes and some reptiles; the heart is not present in zoöphytes; when it has but one cavity in the higher Mammalia, it resembles merely the single heart of Crustacea; and when the auricular septum of the heart remains patent, it is like the reptilian heart. All this is explained by the fact that the embryo of domesticated animals, in arriving at its ultimate development, appears to pass through all the degrees of organization which mark the different types in the zoölogical series.

On the other hand, there is abundant evidence to indicate that untoward environmental conditions, including nutritive wants and vitamin deficiencies, are highly productive of monstrosities and the whole range of anomalous development results. It needs to be emphasized that development is the result of the interaction of the germ-plasm, that is, heredity and environment.

Relatively normal development demands that both be favorable; perfect development would require that both be perfect. Various degrees of imperfection or unfavorableness, in either or both, result in the endless degrees of variation, anomalies, malformations and monstrosities. An intermediate step in the chain of causation may be a disturbance of function or balance in the endocrine system, particularly as concerns the thyroid gland and the *hypophysis cerebri*, producing conditions of dwarfism and gigantism.

The untoward environmental factors leading to the material of teratology are various. For the most part they may be listed

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under the following headings: mechanical, physiochemical, nutritional and faulty implantation. It is clear that the line of demarcation between these groups of factors is not sharp.

Case Reports

The following cases are foals out of different mares, but the mares were all served by the same stallion:

Case 1: Foal born with only three legs, and in perfect condition in all other respects. (See figure 1.)

Fig. 1. Foal born with three legs, but perfect in all other respects.

Case 2: Foal with a "wry neck." Although "wry neck" in foals is relatively common, it is mentioned here only because it was from a mare sired by the stallion in question.

Case 3: Hydrocephalus is somewhat rare in the foal, but one mare served by this stallion was delivered of a foal with hydrocephalus.

Case 4: Born with a navel infection.

Case 5: This foal had a persistent urachus.

As far as can be ascertained, the stallion in question has not produced a foal free from some sort of malformation.

COMMENT

The above cases may be merely coincidental, but nevertheless the farmers are taking their mares to another stud.

THE USE OF DIATHERMY IN THE TREATMENT OF PNEUMONIA IN CATTLE*

By C. E. WICKTOR, *Los Angeles, Calif.*
Los Angeles County Live Stock Department

The successful treatment of pneumonias in human medicine by electric diathermy has warranted some trials and experiments in the field of veterinary medicine. Earlier diathermy machines had a serious drawback in this connection, since there was danger of burns when pads were applied to hairy surfaces. In the later models this has been overcome and diathermy may now be used with safety on live stock when directions are carefully followed.

We have had the opportunity of suggesting the use of this new treatment and observing its results in a limited number of cases of pneumonia in steer calves. Thus far this has been successful and its application appears to have more than ordinary value. The cases responded to treatment much more quickly than to the traditional medicinal agents and established nursing methods used for many years. Recoveries were much more complete, that is, the period of resolution was greatly reduced. In fact, it seemed as though the progress of the disease was stopped almost immediately after applying the pads and turning on the electric current.

These steers arrived in Los Angeles from the Denver Stock Show, on January 23, 1935. The lot consisted of 50 purebred Hereford calves, ranging in age from four to six months and were in good state of flesh. They were shipped in ordinary stock cars and encountered some rather severe weather in passing through the mountains. No drugs or biologics were used upon them prior to this treatment.

One calf was noted to be ill on arrival and died on January 28. The autopsy revealed an extensive lobar pneumonia with pleurisy. Upon examination of those remaining, three more cases were found showing a general depressed appearance, slight dyspnea and temperatures ranging from 104.8 to 106°F. At this time the owner was informed regarding the favorable results reported

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from the use of diathermy in the treatment of pneumonia in the human family.

The following day, one of these calves developed a very severe dyspnea, showed a weak, fast, fluttering pulse, with a temperature of 105.3°F. He was down and unable to arise unassisted. In short, he could not ordinarily be expected to live more than a few hours. The owner immediately secured the use of a diathermy apparatus for this calf. Pads were applied over the dull areas of the lungs with the calf in a recumbent position. A wide elastic

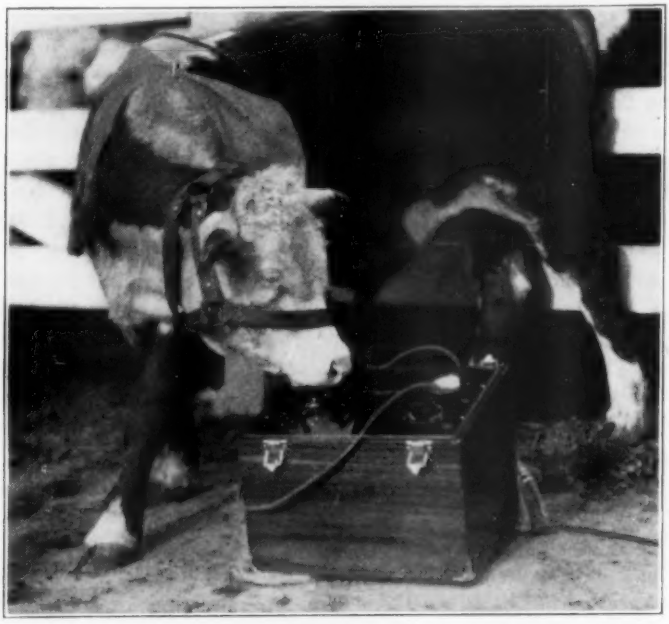

FIG. 1. Steer undergoing treatment with an electric diathermy machine.

band fastened about the chest of the animal was found to be a satisfactory means of holding the pads in proper position on the chest walls.

The apparatus used was a DeForest Short Wave Emitter, operating on an 18-meter wave-length and 16,600,000 cycles per second. Application was effected through the use of two flexible pads, each measuring 8 by 11 inches. The treatments were approximately 25 minutes in duration, with an outgoing current varying from 2,000 to 3,100 milliamperes.

A few minutes after the treatment began, respiration improved; the calf relaxed visibly and appeared drowsy. After ten minutes, there was a noted improvement in the pulse, and at the end of a 25-minute treatment, it was full and strong. During the course of this treatment a mucous exudate began pouring from the nostrils and became so voluminous that it became necessary to raise the patient and support him upon the sternum to prevent suffocation. This discharge became thicker after the treatment and lasted for three days, after which time no further discharge was noted.

The calf showed a gradual improvement until the third day, at which time he had a morning temperature of 103.1°F. He was given his treatment and turned out in the bright sunlight. The day was unseasonably warm, the outside temperature being around 85°F. An hour later, he was observed to have a severe dyspnea and a temperature of 107.6°F. He was placed under shelter and an hour later was considerably improved. On the fourth day, his temperature was below 103.2°F., and on the fifth day, his temperature was normal. By this time his appearance was normal with the exception of a marked pallor of the mucous membranes. He had received two treatments daily, for a total of nine treatments.

Six other calves had developed cases of congestion and pneumonia, none of which were severe, however. All of these were given one treatment daily for two days and made uneventful recoveries. All of the calves remained in the open corrals without shelter. Further studies and observations upon the use of this machine will be made as opportunities are offered.

Care must be taken in the application of the pads to avoid contact with metal or with the attendant's hands or body. If they touch metal or are grounded through manipulation of the attendant, the animal does not get a sufficient charge to derive maximum results. Furthermore, if the body of the animal contacts metal, there is considerable danger of burns developing at the point of contact.

With the rapid development of electricity and chemistry and their application to the treatment of disease of live stock, we have frequent opportunities to improve upon the established methods of handling many of them. This is one very good example. The raising of the temperature of the animal body as a whole, or in localized diseased areas, is receiving considerable attention and careful study. Favorable results have been obtained in several diseases from the use of diathermy. The bactericidal effect of short-wave currents passing through the diseased parts

of the animal body no doubt shares a portion of the credit for the favorable results following the use of short-wave treatments.

A summary of the reactions observed in the animals subjected to diathermy treatment for pneumonia follows:

1. Improved respiration.
2. Improved pulse.
3. Increased mucous discharge from the nasal passages.
4. General relaxation and drowsiness during treatment.
5. Animals not blanketed and treated in the open show very slight advance in temperature, that is, not over 0.5 degree.
6. Period of resolution shortened.

Dr. T. P. White to London

Dr. T. P. White (K. C. V. C. '11), former Assistant Chief of the Division of Tick Eradication in the U. S. Bureau of Animal Industry, has been transferred to London, England, where he succeeds Dr. R. W. Tuck (Ont. '92) who retired in April. Dr. White will represent the U. S. Department of Agriculture in official veterinary matters, report the presence of diseases of possible danger to the live stock industry of the United States and assist and advise in matters pertaining to the shipment of live stock from Great Britain to the United States. Already he has encountered several outbreaks of foot-and-mouth disease, but reports that there has been no recurrence since May 7.

On June 25, Dr. White received the distinctive honor of sitting at a table at the League of Nations in Geneva, as a member of a committee having to do with the international trade agreement in meat and meat preparations. He is the first American veterinarian to be so honored.

Although Dr. White has already spent 35 years in the service of the U. S. B. A. I., he is looking forward to at least three years more, since he hopes to greet a great many American veterinarians at the Thirteenth International Veterinary Congress, to be held in Switzerland in 1938.

Viscera in Reverse

When a three-year-old Norfolk-fed ox was killed by a butcher in England recently, it was found to have all its internal organs reversed. The animal was in perfect health and condition at the time of slaughter, according to a report in the *Veterinary Record*.

DIE UNSICHTBAREN KRANKHEITSERREGER FILTRIERBARE VIRA. EIN LEHRBUCH FÜR ÄRZTE UND TIERÄRZTE. (The Invisible Causes of Disease: Filtrable Viruses. A Textbook for Physicians and Veterinarians.) Josef Balo, Professor of Pathological Anatomy and Histology, Franz-Josef University, Szeged. 311 pages, 36 illustrations and 3 colored plates. Verlag Von S. Karger, Berlin, 1935. Price, RM. 24-.

The last quarter of a century has seen a great advance in our knowledge of the etiology of disease. We have learned, however, that many causes belong in the group known as filtrable viruses. Gradually, we are learning something about the nature of these viruses. This book, devoted entirely to these etiological agents, serves notice that they occupy a not inconsiderable part in the causation of disease.

Dr. Balo received part of his educational training at Johns Hopkins University at Baltimore. He pays tribute to the work of Charles E. Simons and Thomas E. Rivers, Americans who have contributed materially to our knowledge of viruses. The book consists of a general and a special part. Under the first heading, the size of the filtrable viruses is discussed, and its relation to filtration. The general morphology of the viruses and immunity to these diseases and the action of the filtrable viruses on the tissues, make up the remainder of the general part. In the special part, animal and human poxes are described at length. Herpes and other neurotrophic viruses, the organotrophic viruses under which one finds those that have an affinity for the eye, blood-forming organs, blood-vessels, intestines and lymph-glands are discussed. The diseases in which the viruses are found systematically, make up nearly a third of the book. In this group, one notes descriptions of hog cholera, dog distemper, fowl pest, psittacosis and many others.

Another part is devoted to the discussion of what the author calls "Bryozytosen." In this group he discusses the Rous sarcoma and similar tumors, warts, "mollusca contagiosa," and infectious myxomatosis of rabbits.

There is also included a part on filtrable forms of bacteria and protozoa, specific diseases of fish, bee diseases, and mosaic disease of tobacco and other plants. A discussion of filtration and ultra-filtration completes the volume.

The references to the literature are included after the discussion of each such, which makes the bibliography very usable. In the judgment of the reviewer, not a great deal of original material is included in this text. The work of other authors, however, is well presented, and the book makes a welcome addition to our library.

C. P. F.

HISTORY OF THE SCHOOL OF VETERINARY MEDICINE OF THE UNIVERSITY OF PENNSYLVANIA, 1884-1934. Compiled by the Faculty. 225 pages. Illustrated. Veterinary Alumni Society, Philadelphia, 1935. Cloth, $3.

This is a complete history of a famous American school of veterinary medicine, commemorating its semi-centennial anniversary. The book contains 16 sections, the first of which briefly recounts the chain of events since 1807 leading up to the founding of the department in 1884, when the veterinary profession of the United States was tardily beginning to take form, and a few thoughtful men were striving to bring order out of chaos in the live stock industry brought on through the neglect of veterinary education.

Eight sections of the book, written by members of the present faculty, mainly in mixed biographical form, make up a romantic narrative, between the lines of which one reads of the indifference to the welfare of a basic industry none but the veterinary profession has ever attempted to overcome even until the present day.

Dr. Benjamin Rush, of the medical faculty, in 1807 urged the founding of a veterinary department in the University, and other prominent figures in the medical, industrial and agricultural circles approved; yet three-quarters of a century elapsed before such a department was established. However, as set down by a former dean, Dr. Louis A. Klein, it was a stretch of time during which the issue was kept alive by far-seeing men and various organizations devoted to the development of animal production. Obviously, these early gropings in the uncharted field of veterinary education animated the atmosphere in which the first charter for a veterinary college was granted in the United States (January, 1852), the Veterinary College of Philadelphia, an in-

stitution which died aborning because it had neither funds, buildings nor students. This was the first flickering of veterinary education in this country. Its reincarnation occurred seven years later (1859) but only to live out a precarious existence which terminated in 1866, when a new group of quarreling practitioners were granted a charter for the Pennsylvania College of Veterinary Medicine, which lasted but four years. Unfortunately, the new effort developed into a "diploma mill" lasting into the eighth decennium of the century.

There being "no law relating to the practice of veterinary surgery," the demand for diplomas was scarce, and, as few could be inspired to spend time and money to attend a veterinary college, the "college" degenerated into a kind of self-made board that held examinations and issued certificates of membership as late at 1884. Under this unsupportable state of affairs, the medical faculty recommended, in 1878, that veterinary professorships be established in the University, but, inasmuch as the institution was deeply in debt and the prospects of obtaining appropriations from the state legislature were meager, endowments were obtained several years later from private sources, notably from Joshua B. Lippincott, prominent publisher of Philadelphia and trustee of the University, who made possible the founding of the school. With the exception of a small fund set aside for veterinary education in Iowa, in 1879, the Lippincott endowment was the first helping hand given to veterinary education in the United States.

A sketchy recount of the life and work of Rush Shippen Huidekoper, indomitable figure of American veterinary history, the first dean of the school and organizer of the first faculty, is interspersed throughout several of the sections. His struggles for endowments and public appropriations without which the University's ideals could not be attained, his chagrin at the ungrateful governor who vetoed appropriations made by the state legislature for the maintenance of the school, his resignation when all hope seemed lost, and later his efforts in behalf of the veterinary service of the Army, are among the never-to-be-forgotten pages written into American veterinary history by this colorful figure and indefatigable worker of the last two decades of the nineteenth century. To his contemporaries still living, the authors pay too scant a tribute to his memory, since it seems quite incontrovertible that without Huidekoper there might never have been a School of Veterinary Medicine, University of Pennsylvania. He nursed a sickly bud with personal funds and

an influence among the better element of Philadelphia, the equal of which, perhaps, no American veterinarian before or since him has ever enjoyed. The authors, however, err in stating that he was a *graduate* of Alfort. Huidekoper never claimed that distinction but evidently saw no reason to contradict his host of admirers who thrust that honor upon him.

No authors of the near future inditing the history of an American veterinary college will have the proud distinction of pointing out as many distinguished characters among its roster of teachers as did the writers of this book. From Huidekoper to Dick (1884-1935), to name but a few, there were Adams, Bemis, Bergey, Dick, Enge, Flexner, Gay, Gilliland, Glass, Harger, Hoskins (W. H.), Huidekoper, Klein, Lentz, Marshall (C. J.), Pearson, Ravenel, Underhill, Zuill, not to mention other outstanding figures in the medical and veterinary professions, all of whom have richly contributed to the building up of an American veterinary school with fifty years of untainted collegiate history, which stand out as a contrast to the many faults, failings and irregularities characteristic of the unsupported development of veterinary education in North America. To have directed a veterinary school for so many years in the United States without outraging tacit conventionalities is indeed an achievement. The School of Veterinary Medicine, University of Pennsylvania, is the only non-political veterinary educational institution in the United States, and is therefore as rare as its history is glorious.

The book will be a precious possession of the alumni. It contains not only a complete alphabetical list of the faculty since 1884, together with their assignments and the dates thereof, but also a roster of each graduating class since 1887. Incidentally, this reminds one that Dr. H. P. Eves, member of the first class, is still practicing his profession at Wilmington, Del. This, and a directory of the alumni giving the year of graduation, the only source of such information in circulation, are a hint to others.

But, what is a review without fault-finding? The date of the founding of the first veterinary school at Lyon, France, is given as 1762, whereas the fact is that the school was founded August 4, 1761, and was already teaching a class of students in January, 1762. Alfort, which the authors state was founded "two years later," was in the process of organization in 1765 and received the first matriculant in 1766. The authors are in error also when they say that Schmidt discovered the curative action of *inflation* of the udder in milk fever, in 1897. The Schmidt treat-

ment was a liquid intramammary medication. It was several years later when Evers employed gas (air) for the first time in lieu of the Schmidt solution of potassium iodide. The authors also fail to seize the opportunity of pointing out that it was the University of Pennsylvania that turned all American thought of veterinary education from English to German in the '90's, not so much through the teachings of Pearson, as the authors say, but through the nation-wide influence of "Pathology and Therapeutics of Domestic Animals," by Friedberger and Fröhner, translated by Zuill of the veterinary faculty. From the time this classic came out, in 1895, until the present moment, English veterinary literature yielded its place to German translations. The names of Williams, Robertson, Steele, familiar to every American veterinary student of the nineteenth century, gave way to such names as Friedberger, Fröhner, Möller, Deickerhoff, Hoffman, Lungwitz, Hutyra, Marek and others. Whether the change was for the better or the worse, the fact remains that it was Zuill who unconsciously made the revolutionary change which turned all minds from English to German thought in veterinary science in this country. The mere mention that he made the translation is a minor event compared with the transition brought about in American veterinary education.

The book should be indexed for, without an index, the first 142 pages are of little value as a ready reference, since the biographical data are too scattered to make up the chronological narrative intended by the authors. The almost complete absence of subheads in the several sections of the book produces anything but a pleasant effect upon the reader, the result of jumping suddenly from one subject to another without suitable introduction.

L. A. M.

Army Animal Strength Decreasing

The average animal strength of the U. S. Army is on the decrease, according to figures given in the annual report of the Surgeon General for the fiscal year ending June 30, 1934. The number of horses and mules in Army service totaled 29,893 for 1933, as compared with 31,675 for 1932 and 35,160 for 1931. The decrease is due to the reduction in allowances in public animals and to the small number of remounts being purchased each year.

Little things affect little minds.—DISRAELI.

RAPPORTS ENTRE LE SANG ET L'ÉTAT SEXUEL CHEZ LA VACHE (The Relationship Between the Blood and the Sexual State in the Cow). W. Frei. Abst. Rec. de Méd. Vét., cx (1934), 6.

Experiments on this subject had already been made by Emmerson, who established the calcium content of the blood of 285 Bovidae by the method of Collip and Clark. Demmel established facts on the glycemia of cows and Fujita and Iwataka, on the refraction index.

Frei shows by tables that the constitution of the blood varies with age, condition, season and even hours of the day, and that the genital state has a repercussion on its composition having determined that:

1. The blood calcium in the male is lower than in the female.
2. Castration of bulls lowers blood calcium while spaying females seems to have the opposite effect.
3. During estrum, the serum calcium concentration is higher than during the interestrual period. In one daily observation in a cow, the determinations showed a striking augmentation during the estrual period.
4. Glycemia and calcemia run parallel.
5. The refraction of serum diminishes slightly in summer and increases slightly in winter.

L. A. M.

LA FIÈVRE ONDULANTE A "BRUCELLA ABORTUS BOVIS" (Undulant Fever and Brucella Abortus Bovis). Paul Rossi. Rev. Gén. de Méd. Vét., xliv (1935), 518, pp. 66-92.

In an extensive review of the bibliography, this author remarks that the majority of French authors consider the action of Bang's bacillus negligible in man, capable of causing "only a benign infection of short duration in exceptional cases." From personal observation in the Department of Saone et Loire, Rossi is prompted to revise that opinion. The infection in man is less rare than it seems and quite as grave as that due to *Brucella melitensis*. It is necessary only to hunt and find it, to reverse the prevailing notion.

Fifty-nine references are cited, dating from the time the Commission of the Royal Society of London (Bruce *et al.*) investigated the disease on the island of Malta, in 1907, until the present time. Among the America references are the researches of Evans, Moore and Carpenter, Huddleson, DeForest and Hardy, all of whom, together with the others, are quoted to show that undulant fever of Bang's disease origin is not a myth. The human infection is so difficult to diagnose on account of its variable aspects that it can be overlooked by physicians. As pointed out by Dubois and Sollier (*Revue d'Hygiène*, July, 1932), it is passed off as grippe, typhoid, tuberculosis, rheumatism, and so forth. Laboratory diagnoses are not always available to clinicians. In rural districts, the ability to pay may be taken into account. Moreover, when a diagnosis is made, the event is not always declared.

Obligatory declaration of undulant fever at the present time is a dead letter. In one instance, out of 259 cases diagnosed, only 76 were reported. Other delinquencies in declaring the presence of the disease are cited. Brucella are very plastic. Like other microörganisms, they exist in all degrees of virulence which cannot be measured. Some are pathogenic, others attenuated. The conditions under which pathogenic specimens are met require elucidation. Man appears to offer a certain natural resistance to Bang's bacillus, but what are the circumstances under which the resistance breaks down? The constant contact of veterinarians with naturally attenuated organisms explains why the dangerous types do not take a larger toll among them (Thomsen).

It is necessary also to revise the classical notion of alimentary transmission. "In the contagion of undulant fever, ingestion is nil, contact is all" (Lisbonne, 1932). Those who contact animals are the ones most commonly affected: breeders, farm hands, veterinarians, butchers, and others. Transmission from man to man or from man to animal, a possible eventuality, has never been signalized. Transmission by milk and cheese explains the cases among urbanists, but ingestion even among ruralists is a rare mode of contamination. Where milk is commercially pasteurized, the disease is rare. Then, contamination from soiled objects must be taken into account.

Roth, in Germany, attributes the increasing incidence of human infections to premunition (live culture vaccination). Schaffler, Taylor and others entertain the same opinion, but inasmuch as such vaccinations always are done in contaminated herds, opinions in this respect should be reserved. The author cites four human cases, describes each in detail, and points to them as typical among many others. Case 1 was a veterinary

inspector, infected with Bang's bacillus, determined by the Huddleson method. He was sick from August, 1933, to August, 1934. Cases 2 and 3 were farmers, owners of infected herds, and case 4, although not regularly in contact with animals, was a frequent visitor to a farm where there was an aborting cow, as well as a horse with a fistula of the withers.

In regard to abortion in women related to Brucella infection, the author cites Devoir (1905), who reported an abortion in a woman, four months pregnant, who had been exposed to a badly infected herd; Devoir and Theirry (1926), De Forest (1917), of New York, who observed abortion among women exposed to infected cows; Nicolle and Pratt, Larson and Sedwick, who first detected the presence of agglutinins in the serum of aborting women; Klimmer and Haupt (1929), of Germany, and Kristensen and Holm (1929) who observed abortion in the human female on farms where Bang's disease existed; Moore and Carpenter (1926), of this country, and Frei, of Zurich, who demonstrated the presence of *Brucella abortus* in the human fetus. The author emphasizes that the current notion that *Br. abortus* does not cause abortion in the human female should also be revised.

The preventive vaccination, recommended by Dubois and Sollier for the Malta fever zone, could hardly be logically advised everywhere for such a sporadic infection.

The treatment appraised differently in different hands appears to be a combination of chemo- and biological therapy.

Rossi admonishes veterinarians not to regard bovine undulant fever as a casual discovery, a simple curiosity to mention only in books. It has entered a cadre of diseases in which the veterinary clinician can henceforth be caught frequently. Without doubt, the near future will prove this opinion.

L. A. M.

ECOLES OU FACULTÉS (Schools or Faculties). E. Leclainche. Rev. de Gén. Méd. Vét., xliv (1935), 518, pp. 109-112.

A law transferring the veterinary schools from the agricultural department to the department of education has been proposed to the Chamber of Deputies. The great majority of educators hope that the transfer will be made in order that the veterinary faculties may have a legitimate claim on "matériels" to which they would be entitled under a university connection such as exists in nearly all the other countries.

At the Congrès de Marseilles, the council of education voted eight to three in favor of the change. But obviously, under the

threat of the Minister of Agriculture, five of the 16 members did not vote. No action has yet been taken on the side of the agricultural department.

Italy, through recent action, annexed its ten veterinary schools to universities. In Prussia, Hungary, *et al.*, the affiliations are somewhat varied but are sought obviously to gain prestige. In all the world, however, the tendency is to transfer veterinary education from agriculture to the universities. France, which formerly initiated all reforms and progress, now seems to invoke the examples of others.

The author points out that, in nearly all countries maintaining state veterinary institutions, the management rests with the faculties of universities. In some, the teachers are identical or at least they work close to one another. Under this unity, the instructors find a solid base for their just prerogatives.

The question is one of vital importance and one to be studied with great care. There is no need of haste. The transfer would upset the status of the personnel, the entire régime, and also that of the profession.

The veterinary colleges of France are boarding-schools which regulate the number of admissions according to the needs of the moment. Suppression of this status was once decided upon, but under the protestations of the profession it never was enforced. "What would be the reaction on the part of the practitioners if 200 new ones reclaimed a place in the sun each year?" The partisans of the change understand this objection but argue that the competitive examination for admission would settle all that. Yet this is something to be safeguarded.

The effect of separating veterinary education from the Ministry of Agriculture will be discussed in another article, the author declares.

L. A. M.

BRUCELLA INFECTION IN SWINE. Axel Thomson. Acta Path. & Microbiol. Scand. Sup. xxi. (Ejnar Munksgaard, Copenhagen, 1935.)

This work is the result of studies in Brucella infection in swine occurring in Denmark in 1929 to 1932. Reacting boars often show purulent or necrotic inflammatory processes in the genitals. *Brucella suis* was demonstrated in all the glands belonging to the genitals; its frequency was subject to variation. Impairment of general condition, impotency, and ability to transmit the infection were observed in infected boars. Well-defined whitish-yellow nodules, barely visible to pea size, located in the

deeper layers of the mucous membrane, but protruding above the surface and called miliary brucellosis, were observed in the uterus of infected swine. Abortion occurs in infected sows as in cattle but relatively more frequently. *Br. suis* was not isolated from sow's milk but was isolated from the supramammary lymph-glands. *Br. suis* may be strongly pyogenic in swine, abscesses occurring in the spleen, subcutis, thorax, tendon sheaths, etc. Frequent abortion, emaciation, abscess formation, lameness and death were noted as the result of Brucella infection in two swine herds. *Br. suis* was demonstrated in the urine of two boars and one gilt artificially infected.

Br. suis was transmitted to six of ten gilts by infected boars through copulation. Transmission of the infection by the boar is a point of greatest significance. The infection was transmitted by one boar into 25 herds of swine. Infection by way of the conjunctiva, *per os,* and from mother's milk was demonstrated. *Br. suis* may remain viable in the organs of swine for more than one year after the suckling pig has ingested them. The outbreak of brucellosis in Denmark involved 183 herds comprising 1,146 animals. The origin of the epizoötic was not ascertained, but the epizoötic was somewhat analogous to the wholesale appearance of undulant fever in man in Denmark. Both the agglutination test and the complement-fixation test are valuable in the diagnosis of swine brucellosis. Some infected animals sometimes show only agglutination and sometime only complement fixation. Antigens of bovine origin appear more diagnostic than those of porcine origin. Bovine Brucella infection in nine heifers resulted in abortion in every instance but none of eight gilts aborted. Porcine infection resulted in abortion in one gilt and one heifer. Concluding from this and other findings, the author believes that swine brucellosis is a special disease in swine in no direct relation to infectious abortion in cattle. The treatise contains 12 chapters in 253 pages and is excellently illustrated, several of the plates being in color.

M. W. E.

Congratulations, Miss Stewart

Miss Marilee Stewart, daughter of Dr. and Mrs. S. L. Stewart, of Olathe, Kan., was the winner over 75 contestants in a recent radio contest held over station W9XBY and was awarded a silver loving cup and a radio contract. Miss Stewart now appears for 15 minutes each Saturday afternoon from 3:15 to 3:30 over the station. The *Olathe Mirror* for June 5, 1935, carried a story of Miss Stewart's victory, together with her photograph.

Regular Army

Major Floyd C. Sager is relieved from further assignment and duty at the remount purchasing and breeding headquarters, Lexington, Ky., and additional duty at the University of Kentucky, Lexington, Ky., in time to proceed to Front Royal, Va. and report to the commanding officer, Front Royal quartermaster depot, for duty not later than June 30, 1935.

Lt. Col. Harold E. Egan is relieved from his present assignment and duty at the Army Veterinary School, Army Medical Center, Washington, D. C., effective in time to proceed to New York, N. Y., and sail on or about July 30, 1935, for the Hawaiian Department. Upon arrival at Honolulu he will report to the commanding general for assignment to duty with the Veterinary Corps.

Lt. Col. Horace S. Eakins is assigned to duty at Fort Benning, Ga., effective upon completion of his present tour of foreign service in the Panama Canal Department and will join that station and report to the commanding general not later than August 31, 1935, for assignment to duty.

Major Jacob L. Hartman is relieved from duty at Carlisle Barracks, Pa., effective in time to proceed to Fort Monroe, Va., and report not later than June 30, 1935, to the commanding officer, for duty, and is assigned to additional duty as attending veterinarian, Nansemond ordnance depot, Portsmouth, Va.

Captain Verne C. Hill is relieved from duty at Fort Monroe, Va., and from additional duty as attending veterinarian, Langley Field, Va., and Nansemond ordnance depot, Portsmouth, Va., effective in time to proceed to Fort Leavenworth, Kan., and report not later than June 30, 1935, to the commanding general for duty.

Major Elwood L. Nye is relieved from further assignment and duty at the Presido of San Francisco, Calif., effective in time to proceed to Fort Meade, S. Dak., and report to the commanding officer, not later than June 30, 1935, for duty.

Major Gardiner B. Jones is relieved from duty at Fort Meade, S. Dak., effective in time to proceed to the Presidio of San Francisco, Calif., and report to the commanding officer for duty not later than June 30, 1935.

Major Frank H. Woodruff is relieved from further assignment and duty at Fort Bliss, Texas, effective in time to proceed to San Francisco, Calif., and sail on transport scheduled to leave that port for New York, N. Y., on or about June 7, 1935; upon arrival in New York City will proceed to Baltimore, Md., and report not later than June 30, 1935, to the commanding general, Third Corps Area, for duty at his headquarters and, in addition, will act as attending veterinarian at Fort Howard, Md., and Holabird quartermaster depot.

Second Lt. Ray S. Hunsberger is relieved from further assignment and duty as student, Medical Field Service School, Carlisle Barracks, Pa., effective upon completion of his present course of instruction, on or about June 5, 1935, is then assigned to station at the Presidio of

Monterey, Calif., and will proceed to Brooklyn, N. Y., and report to the commanding general, New York port of embarkation, for temporary duty until such time as will enable him to sail on the transport scheduled to leave that port, on or about October 31, 1935, for San Francisco, Calif.; upon arrival at San Francisco, will proceed to the Presidio of Monterey, for duty.

Each of the following-named second lieutenants of the Veterinary Corps is relieved from further assignment and duty as student, Medical Field Service School, Carlisle Barracks, Pa., effective upon completion of his present course of instruction, on or about June 5, 1935, and will proceed to the stations as indicated after his name and report to the commanding officer for duty not later than June 30, 1935.

Curtis W. Betzold, Fort Sam Houston, Texas.
William F. Collins, Fort Sill, Okla.
William E. Jennings, Fort Ringgold, Texas.
James B. Nichols, Fort Oglethorpe, Ga.

Second Lt. Russell McNellis is relieved from further assignment and duty at station hospital, Fort Oglethorpe, Ga., effective in time to comply with this order, and will proceed to Washington, D. C., and report not later than June 30, 1935, to the commanding general, Army Medical Center, for duty.

Veterinary Reserve Corps

No changes.

Colonel Foster Visits Chicago

Colonel Robert J. Foster, V. C., U. S. A., Office of the Surgeon General, Washington, D. C., was in Chicago, June 27-29, to attend the conference of the Institute of American Meat Packers, with reference to the grading of beef in connection with Army and CCC purchases.

BUREAU TRANSFERS

Dr. J. E. Dwyer (O. S. U. '14), from Phoenix, Ariz., to Salt Lake City, Utah, in charge of meat inspection.

Dr. John L. Core (Gr. Rap. '15), from Baltimore, Md., to Albany, N. Y., on tuberculosis eradication.

Dr. J. J. Martin (U. S. C. V. S. '17), from Pittston, Pa., to Albany, N. Y., in charge of meat inspection.

Dr. W. R. Van Ness (Ont. '07-McK. '08), from Detroit, Mich., to Pittsburgh, Pa., on meat inspection.

Dr. Don B. Strickler (Chi. '15), from Columbus, Ga., to Houston, Texas, in charge of meat inspection.

Dr. A. H. Francis (St. Jos. '15), from Lincoln, Neb., to Denver, Colo., in charge of tuberculosis eradication.

Dr. J. O. Wilson (O. S. U. '08), from Denver, Colo., to Lincoln, Neb., in charge of tuberculosis eradication.

Dr. John J. Hayes (N. Y.-Amer. '00), from New York, N. Y., to travel status, on meat inspection.

Dr. Ralph V. Pilgrim (K. C. V. C. '15), from Fort Worth, Texas, to Baton Rouge, La., on tick eradication.

Dr. William C. Glockner (U. P. '20), from Little Rock, Ark., to Jackson, Miss., on tuberculosis eradication.

COMMENCEMENTS

KANSAS STATE COLLEGE

The seventy-second annual commencement exercises of Kansas State College were held at Manhattan, May 27, 1935. In the Division of Veterinary Medicine, 52 candidates received the degree, Doctor of Veterinary Medicine. They are:

*Stephen G. Asbill
Ottis E. Ballenger
Monroe Balton
Jesse C. Brock
Joseph L. Cavanaugh
*Arthur H. L. Daman
William Dekker-van Ghyl
*Lawrence C. Donat
Herbert H. Fechner
*Oscar F. Fischer
Edward W. Frahm
Hubert R. Hein
*Leonard W. Hibbs
Crosby J. Hook
David M. Howard
Harold J. Jewell
Sanford E. Johnson
*Donald C. Kelley
Samuel Kelsall, III
*George M. Kerr
Joseph F. Knappenberger
James Kral
Elmer I. Long
*Glenn M. McFadden
*Don L. Mace
Joseph D. Manges
*Edwin L. Millenbruck
*Roy F. Miller
Wilson M. Osteen
Wilbert E. Osterholtz
Eusebio A. Pérez
*Leonce L. Picot, III
*William H. Rockey
Leonard A. Rosner
Paul D. Ross
Kenneth E. Sadler
*Clarence P. Schmidt
John C. Smith
Jacob E. Spring
*Charles D. Stafford
Clarence M. Stay
Frank A. Story
Willis A. Thomson
*Clarence C. Vierling
William F. Waddell
Clement E. Watson
*Lillis R. Wempe
Theodore S. Williams
William W. Williamson
*Edwin S. Wiseman
*Wilbur H. Wiswell
*Samuel F. Zickefoose

Twenty members of the graduating class (indicated by *) received commissions as second lieutenants in the Veterinary Reserve Corps of the United States Army.

High honors were awarded to Oscar F. Fischer and Donald C. Kelley. Honors were awarded to Lawrence C. Donat, Herbert H. Fechner and Joseph F. Knappenberger.

ALABAMA POLYTECHNIC INSTITUTE

The sixty-third annual commencement exercises of the Alabama Polytechnic Institute were held at Auburn, May 27, 1935. In the School of Veterinary Medicine, 19 candidates received the degree, Doctor of Veterinary Medicine:

Clyde Bass
Frederick Bradley
Theodore W. Brown
Eugene Callan
Sidney M. Cork
James Deubler
Frederick M. DeWees
Colby Graves
Frank C. Harris
James C. Hickey
Jerald H. McChesney
Andrew J. McCreary
John R. Nettles
Karl R. Owens
Albin G. Pass
John E. Stiles
Taylor T. Wiggins
Coy L. Williams

Harry M. Woods

Karl R. Owens was the honor student of the class. On June 1, 14 of the graduates began work in connection with tuberculosis eradication, while the remaining five entered upon active practice in Massachusetts, Virginia, Alabama and Florida. Placing of the graduates was due largely to the efforts of the Acting Dean, Dr. I. S. McAdory.

COLORADO STATE COLLEGE

The annual commencement exercises of Colorado State College were held, June 6, 1935. The Division of Veterinary Medicine presented 31 candidates for the degree, Doctor of Veterinary Medicine:

Rolland Anderson
Ray S. Attaway
Clyde W. Bean
Robert Bean
Donald C. Beard
Carl Brillhart
Graham Davidson
Robert W. Davis
Loyal H. Fisk
Vernon Golden
William Goodfellow
Joe W. Harrison
Ed R. Holland
Carl Howarth
Archie Inman
Clarence Johnston
Harry R. Lancaster
U. Stanley McConnell
William McMichael
Floyd R. Mencimer
Josh P. Meyer
John C. Milliken
William K. Riddell
M. N. Riemenschneider
Marion F. Sample
Wayne Shipley
Lorenz St. Clair
Hugh W. Stevens
Russell J. Stewart
Carlton Sundberg

Ralph Younce

Scholarship honors went to Lorenz St. Clair, who not only had the highest scholastic standing among the graduates of the Division of Veterinary Medicine but also among the 173 graduates of the entire College.

Two graduates whose names do not appear on the list, Esten B. Orme and E. Ted Reiser, received their degrees at the midyear commencement of the College, January 18, 1935. They are now employed in emergency work with the U. S. Bureau of Animal Industry in Colorado. Members of the present graduating class, with the exception of three, have been given similar employment.

The three exceptions are: William Goodfellow, who will enter practice at Sheridan, Wyo.; M. N. Riemenschneider, who will become associated with Dr. A. G. Wadleigh (Colo. '10), of Monte Vista, Colo.; and William K. Riddell, who goes to San Diego, Calif., where he will be associated with Dr. M. W. Kreuziger (McK. '10).

OHIO STATE UNIVERSITY

The fifty-eighth annual commencement exercises of Ohio State University were held on June 10, 1935. The commencement address was delivered by Dr. George W. Rightmire, president of the University.

The College of Veterinary Medicine presented 52 candidates for the degree, Doctor of Veterinary Medicine, as follows:

Henry J. Apple
Joseph E. Badger
Lowell R. Barnes
Jack D. Bender
George Berger
Max Carlin
John H. Collins
Allen E. Corbin, Jr.
Benjamin F. Corbin
Danford L. Cox
Odin E. Dovre
David S. Elsasser
Lewis W. Evans
Robert A. Ewing
John A. B. Fleming
Glen O. Fly
Irvin W. Frock
Bernard H. Gibson
Charles L. Haupert
Dwight G. Herd
Charles P. Hesse
Vaughn E. Ishee
Edgar S. Johnson
Thomas P. Koudelka
William N. Kramer
Joseph D. Kress
Leo L. Lieberman
Charles B. Linzinmeir
Jacob P. Mauney
Hugh C. McCormick
Harry F. McEwan
Arthur E. Moats
Joseph B. Morse
Charles M. Muniz
Charles M. Parker
Max R. Peters
William E. Rhodes
Peter S. Roy
Ernest E. Saulman
Ke Tun Shen
Leo S. Shives
Emanuel Silverstein
Earl M. Simonson
Claude A. Smith
Phillip A. Sollomi
Harold M. Spangler
Forrest F. Tenney
Carl C. Tucker
Jennings L. Ward
Robert S. Warnock
Clifford W. Wilder
Clarence A. Woodhouse

The degree, Master of Science in Veterinary Medicine, was conferred on Matthew Eggert (O. S. U. '33).

President Rightmire conferred the degrees, following the formal presentation of the candidates. The diplomas were awarded by Dean Oscar V. Brumley.

Sheldon W. Stout was graduated at the close of the 1935 winter quarter, on March 15. Robert Blake received his degree at the end of the autumn quarter, on December 21, 1934.

A. AND M. COLLEGE OF TEXAS

The fifty-ninth annual commencement exercises of the Agricultural and Mechanical College of Texas were held at College Station, May 31, 1935. Thirteen senior students in the School of Veterinary Medicine were awarded their degrees:

Robert J. Anderson
Cesar Clavell
Weldon M. Couch
Henry Fisherman
Valentin Martyn
Elden C. Nicholl
Absalom B. Rich, Jr.
Emmett T. Riley
William M. Thompson
Jackson O. Whitehead
James D. Williams,Jr.
Walter E. Wupperman

Andrew M. Zubl

Three of the graduating class were named as "distinguished seniors" on the basis of a high average in grade points: Cesar Clavell, James D. Williams, Jr., and Walter E. Wupperman.

MICHIGAN STATE COLLEGE

Commencement exercises at Michigan State College were held June 10, 1935. On that occasion, the degree of Doctor of Veterinary Medicine was conferred on 23 candidates presented by the Division of Veterinary Science:

Earl G. Boydston
Marley C. Clark
Frank A. Colby
Joseph R. DeVries
Kenneth H. Fraser
Theodore J. Hage
Cecil L. Hendee
Nelson S. Howe, Jr.
Christian G. Jensen
Chester A. Manthei
(*magna cum laude*)
Fred M. Murdock
James S. Nash
William B. Platt
Julian F. Purvis
Robert C. Rea
John F. Ryff
(*magna cum laude*)
Oscar J. Sorenson, Jr.
Maxwell M. Stiles
(*magna cum laude*)
Norman H. Stoner
Thomas C. Stresser
William T. S. Thorp
Morris Tropp
Robert J. Veenstra

John F. Ryff won the Michigan State Veterinary Medical Association Prize of $25, awarded to the senior veterinary student doing the best work in his course.

John J. Arnold won the Veterinary Prize of $25, pledged annually by the veterinary faculty, which is awarded at the opening of the fall term to the veterinary sophomore who, during his freshman year, has made the best scholastic record of the class.

Three former graduates of Michigan State College were awarded advanced degrees. Dr. H. J. Stafseth ('17) was made a Doctor of Philosophy. Dr. Charles C. Morrill ('33) and Dr. O. Herbert Muth ('29) were given the degree, Master of Science.

Robert T. Habermann, a student in veterinary medicine at the College, also received the Master of Science degree.

Fourteen members of the graduating class plan to go into private practice. The remaining nine will be employed as follows: six with the U. S. Bureau of Animal Industry, one in commercial work, one in laboratory work, and one working toward an advanced degree.

STATE COLLEGE OF WASHINGTON

The annual commencement exercises of the State College of Washington were held on June 10, 1935. The roster of the graduating class from the College of Veterinary Medicine numbered 22, five of whom had completed work toward their degrees in February. Those receiving the degrees, Bachelor of Science and Doctor of Veterinary Medicine, during 1935 were:

William C. Bellis
*Ernest F. Chastain
Howard E. Clarke
William F. Daut
C. Alvin Eshelman
Robert P. Gobler
George Harvey
*Kenneth R. Hoyt
Henry W. Jacobson
Thomas C. Jones
Bernard Koch
*Leslie R. Libby
*Frank Lucich
*William I. Mendenhall
William E. Niemeyer
George F. Peeples
Charles J. Rose
*Charles M. Saunders
Esmond V. Smith
L. Gordon Soderholm
*Ensly R. Storey
*Ernest S. Watkins

Eight members of the graduating class (indicated by *) received commissions as second lieutenants in the Veterinary Reserve Corps of the United States Army.

Thomas C. Jones received his degree "with highest honors," and Ernest F. Chastain "with high honors." Howard E. Clarke, Bernard Koch, Leslie R. Libby and L. Gordon Soderholm were awarded their degrees "with honors." With few exceptions, all members of the class have already accepted positions or have gone into private practice.

IOWA STATE COLLEGE

Commencement exercises at Iowa State College were held on June 10, 1935. The senior class in the Division of Veterinary Medicine this year was the first class to be graduated from a veterinary college in the United States under the requirement of one year of college for entrance. Owing to the short notice of this increased requirement, given in 1931, only 14 students were able to finish the prescribed course this year:

William H. Bassett
*Carl F. Brenner
Jacob C. Kaiser
*Alfred G. Karlson
*H. Brooks Keith
George W. Mather
Clarence P. Meredith
*Oscar O. Mosby
Carlos T. Rosenbusch
John H. Ryan
Irwin A. Taylor
*Walter G. Venzke
Calvin W. Waller
Z. Yoshio Yamoshiro

The honor student of the class and the winner of the George Judisch Scholarship prize was George W. Mather. The prize consists of initiation fee and membership dues in the A. V. M. A. for five years. Winners of the G. G. Graham Prizes, awarded to outstanding students in clinical medicine, were Oscar O. Mosby, first, and Jacob C. Kaiser, second.

Five of the graduating class (indicated by *) received commissions in the Veterinary Reserve Corps of the United States Army.

The names of initiates into Phi Zeta, national honor society, were published in the April issue of the JOURNAL.

UNIVERSITY OF PENNSYLVANIA

The 179th annual commencement exercises of the University of Pennsylvania were held on June 19, 1935. On that occasion, 25 graduates received the degree, Doctor of Veterinary Medicine, as follows:

Guy F. Abell
Robert L. Booth
Ronald H. Bruce
Harold Burstein
Ervin A. Eichhorn
Jack R. Emas
Salem G. Fine
Elwood G. Fooder
Harry Frank
Richard H. Gaetz
Simon J. Goodman
John B. Hickman
Emory M. J. Hose
John E. Kellberg
Bernard S. Klausman
John P. Maugel
James M. Murphy
J. Nelson Newcomer
Harry L. Phillips
Jacob B. Richter
Alexander J. Rosenberg
Robert R. Shomer
Arnold M. Snyder
Amos W. Stults
William H. Waddell

The J. B. Lippincott Prize of $100, for the highest general average in examinations, and the T. E. Munce Prize of $25, for the highest average in the courses in Animal Industry, were awarded to Arnold M. Snyder.

The Jeannette Blair Prize of $50, for the best work done in the Small-Animal Clinic, was awarded to Emory M. J. Hose.

The Leonard Pearson Prize of $50, awarded to the member of the senior class who has shown that he is most capable of dignifying and advancing veterinary science in research, in prac-

tice, in education and in its relation to civilization, was won by James M. Murphy.

CORNELL UNIVERSITY

The sixty-seventh annual commencement exercises of Cornell University were held on June 17, 1935. At that time, 55 candidates for the degree, Doctor of Veterinary Medicine, were presented by the New York State Veterinary College:

George W. Badger
David Barsky
Walter L. Benedict
Donald O. Bixby
William Boardman
Roswell L. Brown
Herbert J. Buell
Harold D. Cain
Walter T. Carll
Clive B. Chambers
Philip C. Close
Howard S. Dickson
Michael J. Donahue
Charles D. Ebertz
William E. Eggert, Jr.
David Ehrlich
Richard L. Fortune
Edwin N. Foster
Richard T. Gilyard
Harry M. Glass
Tevis M. Goldhaft
Harry I. Goldwasser
Samuel E. Herman
Willard C. Higby
Alfred L. Holt
Clifford H. Hoppenstedt
Samuel F. Huber, Jr.
Samuel Hutt
Theodore E. Jabbs
Ferdinand O. Johanson
Stanley M. Krukowski
Frederick Markham
Jack Mindell
Arthur F. North, Jr.
Stanley G. Penny
Donald W. Pulver
Karl E. Putnam
William C. Reese
Edward A. Rogoff
Henry Rudman
Frederick N. Schafer
William J. Seagers
Richard L. Stone
Winfield S. Stone
Emanuel Tarlow
Montgomery A. Tegg
Albert K. Tice
William F. Tierney
Ferdinand G. Trudel
Bernard F. Trum
Hendrik Versluis
Leslie A. Weight
Henry C. Weisheit
Engueda Yohannes
Irving Zimmerman

In addition, one other graduate, Raymond J. Pierce, received his degree at the end of the first term, February 6, 1935.

The following prizes were awarded for the academic year, 1934-1935:

The Horace K. White Prizes (Meritorious Students):
First Prize, $100 ..... Michael J. Donahue
Second Prize, $25 ..... Herbert J. Buell

The Jane Miller Prizes (Veterinary Physiology):
First Prize, $30 ..... Henry Kriesel
Second Prize, $25 ..... Sidney Nathanson

The James Gordon Bennett Prizes (Surgical Clinics):
First Prize, $30 ..... Richard T. Gilyard
Second Prize, $20 ..... Michael J. Donahue

The Anne Besse Prizes (Veterinary Medicine):
First Prize, $30 ..... William Boardman
Second Prize, $20 ..... Walter L. Benedict

The Charles Gross Bondy Prizes (Small-Animal Clinics):
First Prize, $25.....Arthur F. North, Jr.
Second Prize, $15.....Roswell L. Brown
The Merry Prizes (Anatomy):
First Prize, $30.....Dorsey W. Bruner
Second Prize, $20.....George C. Schloemer

UNIVERSITÉ DE MONTRÉAL

The following nine graduates from the École de Médecine Vétérinaire de la Province de Québec, Université de Montréal, received the degree of Doctor of Veterinary Medicine, at the commencement exercises on June 16, 1935:

Jean Dereix
Robert Gérald *(cum laude)*
Roland Nadeau *(cum laude)*
Roméo Otis *(cum laude)*
Georges Poirier *(cum laude)*
Alcide Raiche
Alex. Ricard *(cum laude)*
Anselme Roy *(cum laude)*
Henry Trudel *(magna cum laude)*

Cow 38 Years Old

What is believed to be an example of unique old age in a cow is that recently reported by Mr. M. J. Byrne, a student at the Veterinary College of Ireland, Dublin. The cow, a Shorthorn, is said to have been born in 1897—38 years ago—during the boyhood of its owner who has a clear recollection of the animal from its birth and in whose possession it has since remained. The cow was a regular breeder up to 1931, since when she has become barren despite the recurrence of estrum and service. She is still in good health and in moderately fat condition, although she shows the following abnormalities: There are three unworn and presumably newly developed central incisor teeth standing out in contrast to the remnants of her old incisors which are worn to the gums; the cow has grown a new pair of horns in place of the old ones, which were shed some years ago; there is a straggling abducting movement of the hind limbs during walking, but no apparent difficulty is noticeable when she lies down and rises.

Veterinary Record.

Dallas Bars Uninspected Meat

Health authorities of Dallas, Texas, have barred the sale of meats in that city from packing-plants which do not have federal inspection, according to the *Cattleman.*

Dr. Mark Welsh Made State Veterinarian

In the recent reorganization plans of the Maryland State Board of Agriculture, Dr. Mark Welsh (Mich. '19) has been appointed State Veterinarian. The office of State Veterinarian has been newly created to take the place of that of Director of the Live Stock Sanitary Service, which the Board has abolished. Dr. Welsh succeeds Mr. J. B. George, whose poor health made it necessary for him to give up the heavy duties of Director. Mr. George has been given the title of Executive Secretary and still

DR. MARK WELSH

remains closely allied with the work which Dr. Welsh will administer.

For the past two years, Dr. Welsh has been in charge of the Biological and Live Stock Sanitary Service Laboratories at the University of Maryland, College Park. He is also secretary-treasurer of the Maryland State Veterinary Medical Association and A. V. M. A. resident secretary for his state.

Motor to Oklahoma City

The choice of Oklahoma City as the meeting place of the A. V. M. A., August 27-30, should be pleasant news to motoring enthusiasts, for there are many who will want to take advantage of the paved highways that lead into the city from all parts of the country. These highways pass through historic sections that will be well worth a stop-over. One such place is the Arbuckle Mountains, about 75 miles south of Oklahoma City, and said by geologists to be the oldest surface formations in the United States. The Platt National Park nestles in the Arbuckle Mountains, and promises a variety of scenery to the lover of nature. Fifteen miles of driveways and miles of footpaths make accessible its numerous streams, lakes and waterfalls. The Park also boasts of 32 hot and cold sulfur springs.

Oklahoma City Live Stock Exchange Building

To Improve the Dog Food Industry

A Scientific Council for the Dog Food Industry has been established by the National Dog Food Manufacturers' Association. Chairman of the Council is Dr. George R. Cowgill, associate professor in the Department of Physiological Chemistry, Yale University. Other members are William E. Anderson, assistant professor in the Department of Physiological Chemistry, Yale University, and L. E. Bopst, associate state chemist of Maryland, and secretary of the Association of American Feed Control Officials. The Council will act as a scientific advisory research agency of the Association and as a scientific referee for it. More detailed information about the aims of the National Dog Food

Manufacturers' Association and what it hopes to accomplish through the setting up of a Scientific Council may be found in an article on "Standards for Canned Dog Food," which appeared in the January, 1935, issue of the JOURNAL.

One Hound Dog Plus

The stork overtook a railway express train carrying one hound dog to W. V. Fletcher, at Mason City, Ill., and augmented Mr. Fletcher's purchase by eight new puppies, according to an item in *Dog World*.

TYPICAL OKLAHOMA CITY HOME

Oklahoma City Coliseum

The Oklahoma City Coliseum, where the clinic of the A. V. M. A. annual meeting will be held, is the headquarters of what is rated as the nation's largest Junior Live Stock Show held each spring. This year's show, which was held late in March, attracted thousands of boys and girls and hundreds of blooded stock entries in the competition for $4,000 in cash prizes offered by the Oklahoma City Chamber of Commerce to the farm boys and girls of the state.

The Coliseum stands on a site that was formerly occupied by another huge structure before its destruction by fire. In this building, there was held, for some years, a Senior Live Stock Show that attracted wide attention. In this same locality, within a few miles of the geographical center of the state, is the live stock and packing center, not only of Oklahoma, but of a much larger territory. The large packing-plants of Wilson and Company and Armour and Company are in the vicinity of the Coliseum.

New York Broadcasting Program

The New York State Veterinary Medical Society sponsored the following talks given over WGY, from January 11 to June 28, 1935:

January 11—"Domestic Animals in the Eyes of the Law," Dr. J. G. Wills, New York State Department of Agriculture, Albany.

January 25—"Disease Prevention in Dairy Herds," Dr. Lynn H. Tripp, Albany County Veterinarian, Albany.

February 8—"Raising Your Milk Standards," Dr. John E. Greenway, City Veterinarian, Schenectady.

February 22—"An Orderly Life for Your Bull," Dr. James S. Carnrite, Fort Plain.

March 8—"Animal Disease and Human Health," Dr. W. A. Hagan, New York State Veterinary College, Ithaca.

March 22—"Don't Spray Where Cattle Stray," Prof. L. J. Cross, New York State Department of Agriculture, Ithaca.

April 5—"Horse Sense About Horses," Dr. L. L. Parker, Catskill.

April 19—"Disease of Suckling Pigs," Dr. B. J. Cady, U. S. Bureau of Animal Industry, Albany.

May 3—"Telling the Age of the Horse by the Teeth," Dr. E. Sunderville, New York State Veterinary College, Ithaca.

May 17—"The Trouble of a Colt," Dr. M. G. Fincher, New York State Veterinary College, Ithaca.

May 31—"Your Dog and Whence He Came," Dr. F. D. DuB. Smith, East Chatham.

June 14—"Practical Veterinary Help on the Farm," Dr. L. E. Moore, Amsterdam.

June 28—"An Analysis of the Water Situation," Mr. R. D. Bates. New York State Department of Health, Albany.

The following program is announced for broadcasting, beginning on July 18:

July 18—"Wire Cuts and Other Wounds in Farm Animals," Dr. Walter L. Gilbert, Cobleskill.

August 1—"Pasture Diseases," Dr. John K. Bosshart, Camden.

August 15—"Care of the Brood Mare," Dr. Cassius Way, New York City.

August 29—"Range Paralysis in Chickens," Dr. C. C. Ellis, New York State Veterinary College, Ithaca.

September 12—"Common Accidents to Dogs and Cats," Dr. F. F. Fehr, Buffalo.

September 26—"Examining Cows for Sale," Dr. S. D. Johnson, New York State Veterinary College, Ithaca.

October 10—"Rôle of the Veterinarian in Public Health," Dr. Crittenden Ross, New York City Department of Health, Middletown.

October 24—Keeping the Bull Feeling Bully," Dr. L. J. Tompkins, New York City.

November 7—"Flavor: An Important Factor in Selling Milk," Dr. J. D. Brew, New York City.

November 21—"Pig-Pen Practice for Winter," Prof. John P. Willman, New York State College of Agriculture, Ithaca.

December 12—"The Gift Pup," by Dr. K. S. Friderici, Scotia.

December 26—"Preventing Animal Accidents Due to Electrical Installation," Mr. Dallam E. Blandy, Albany.

These biweekly programs are broadcast on Thursdays, at 12:45 P. M., Eastern Standard Time.

Dr. Benbrook Honored by Appointment

Dr. Edward A. Benbrook (U. P. '14), Professor and Head of Veterinary Pathology at Iowa State College, has been appointed a member of the board created by the Iowa Basic Science Law passed at the recent session of the legislature, requiring all prospective practitioners of the healing art to pass a basic science examination before they take the State Board examination for their licenses to practice. Dr. Benbrook was appointed a member of the board for six years and will give the examination in pathology. Veterinarians are in no way affected by the new law.

DR. EDWARD A. BENBROOK

The board consists of six members "learned respectively in (1) anatomy, (2) physiology, (3) chemistry, (4) pathology, (5) bacteriology and (6) hygiene," appointed from the faculties of the universities and four-year colleges accredited by the Iowa State Board of Medical Examiners. According to the provisions of the law, no member of the board shall hold a degree in any of the healing arts. Besides Dr. Benbrook, other members of the board are: W. L. Strunk, professor of biology and chemistry, Luther College, Decorah; B. H. Peterson, professor of chemistry, Coe College, Cedar Rapids; R. E. O'Brian, president of Morningside College, Sioux City; J. H. Bodine, professor of biology, State University of Iowa, Iowa City; C. H. Carter, professor of biology, Parsons College, Fairfield.

Dr. Benbrook is a member of the A. V. M. A. Committee on Education.

COMMUNICATION

THE A. V. M. A. FOR VETERINARIANS

TO THE EDITOR:

Members of the A. V. M. A. who are sincerely interested in the future of our organization should give serious consideration to the proposed amendment to the constitution to admit to active membership those who are not veterinarians. This matter has been called to the attention of readers of the JOURNAL in the minutes of the 1934 meeting of the House of Representatives and also in a later issue. A final vote will be taken at the Oklahoma City meeting.

The reasons for this radical change are not very clearly defined and, to the writer, the move appears ill-advised and unjustified. We now have a strong, well-integrated organization with very definite requirements for membership. What useful purpose can be served by letting down the bars? We require that, in order to practice veterinary medicine, a man shall have pursued a certain definite course of training in animal health and disease. Is any less knowledge required to formulate policies with respect to the control of animal diseases, or to discuss intelligently rational methods of treatment? If this proposal is adopted, laymen will have an equal voice with veterinarians in the determination of the policies of our association.

It is true that the number of laymen admitted in the next year or two may not be large, but what of the years to come? Who will judge the qualifications of those who will be admitted, and how are we to limit their numbers? In the past we have elected certain outstanding individuals to honorary membership, and there is every reason why we should continue this policy. If membership without the voting privilege can serve any good purpose, there should be no objection to granting it. But in what way could honorary or associate members render greater service if they were admitted to active membership? Would we feel as free to discuss controversial matters of policy if they were present? Will some of these new members be recommended just to pay some friend a compliment or for the sake of patronage? Do they know our problems so that they can

vote any more intelligently than we could vote in matters involving their work?

This question should be considered from all angles and with due regard for its possible consequences. The man who is best fitted to render us valuable service by his counsel realizes his limitations and would not care to cast a vote to decide our policies. He would not care to join as an active member. Should others who may be less conscious of their limitations be granted the vote?

Recently one state veterinary medical association (New York) unanimously passed a motion instructing its delegate to vote against the amendment. I hope other societies and groups will give the matter the most serious consideration. As it appears to the writer, the proposal paves the way for a less compact and less unified profession.

HERBERT L. GILMAN.

Ithaca, N. Y., June 24, 1935.

Belfast Meeting of N. V. M. A.

The National Veterinary Medical Association of Great Britain and Ireland will hold its annual meeting at Belfast, Ireland, July 29 to August 2, 1935. The literary program is divided into three sections: Veterinary Medicine and Surgery, Experimental Pathology, and Public Health. Presidents of the three sections are, respectively, J. Ewing Johnson, M. R. C. V. S., Prof. J. Basil Buxton, F. R. C. V. S., and F. J. Daly, M. R. C. V S. Two papers are to be presented at each of the sectional programs. Tours to points of interest in and near Belfast, an exhibition of veterinary supplies, receptions and banquets, operations and demonstrations and general meetings make up the rest of a full five-day meeting.

Bull Moose Runs Amuck

A bull moose snorted into the business section of Dover Foxcroft, Me., recently, demolished the entrance to the office of the telephone company, chased a citizen around a telephone pole, scattered pedestrians on the main street and wrecked everything that was wreckable. That accomplished, he continued on to the Piscataquis River, jumped in and swam away, according to the *American Field.*

Delay always breeds danger.—CERVANTES.

COLORADO VETERINARY MEDICAL ASSOCIATION

The semi-annual meeting of the Colorado Veterinary Medical Association was held at Colorado State College, Fort Collins, May 23-24, 1935, with approximately 50 veterinarians in attendance. This was considered a splendid attendance, in view of the fact that the meeting was held during the busy season for the practitioner and, further, that travel was considerably impeded by the rainy weather. The spring meeting is held at the College at the end of the school year, thus enabling the veterinary students to attend and benefit by the contact with successful practitioners, hearing the literary program and discussions and observing the demonstrations at the diversified clinic.

The opening session was called to order by the President, Dr. E. N. Stout, of Fort Collins. A short business meeting was held, after which a literary program was presented as follows:

"Equine Gastro-Enteritis," by Dr. N. J. Miller, of Eaton. This paper was devoted principally to the condition known as acute dilatation of the stomach and to impaction balls so frequently encountered in districts where alfalfa is fed. A lively discussion followed the presentation of the paper.

"Suturing Materials and Suturing," by Dr. H. E. Kingman, of Cheyenne, Wyo. This was a demonstration and discussion of materials and methods used by Dr. Kingman in treating prolapses of the genitalia. The subject was presented in a very practical manner and created considerable interest.

The afternoon session was opened with a paper on "Feline Infectious Enteritis," by Dr. C. E. Salsbery, of Kansas City, Mo. Dr. Salsbery and his staff have conducted extensive research on this subject, which has added greatly to the meager knowledge available to the profession. An address of welcome was delivered by Dr. Charles A. Lory, president of Colorado State College. Dr. Lory has the knack of making one "feel at home" and of convincing his listeners that they are part of an organization that is second to none. Naturally in an atmosphere of this kind, every person mentally resolves to "hit the ball" a little harder. The rest of the afternoon was devoted to

the clinic. Since so many practitioners were interested in both large- and small-animal practice, a change from a sectional to an alternate clinic was requested and the program so arranged. Dr. George H. Carr, of Brighton, was chairman of the large-animal section, and Dr. C. C. Stewart, of Colorado Springs, was chairman of the small-animal section.

The clinic was presented with the request that each operator review the field of operation and the pitfalls to be evaded in connection therewith, and the procedure for after-care. The removal of opaque crystalline lens was demonstrated by Dr. A. A. Hermann, of Denver. Dr. Hermann has devoted his entire time for several years to the small-animal phase of practice and has developed a very skillful surgical technic. He also performed a canine tonsillectomy.

The out-of-state talent for the surgical program was Dr. George R. Fowler, of Iowa State College, who discussed concisely the field of operation and the advantages and disadvantages of certain methods as found from his own experiences. The opportunity to witness Dr. Fowler work is truly a revelation, for he is outwardly calm, and as adept with one hand as the other, yet each move is executed in a neat and precise manner that reveals an operator that knows definitely what he is doing. All those who saw Dr. Fowler in action classed him as one of the best surgeons in the profession. The operations performed by Dr. Fowler were as follows: Resection of the plantar aponeurosis (equine) to establish drainage; removal of the lateral cartilage (equine), and trephining of a molar (equine). Considerable discussions relative to the after-care of cases followed.

The second day opened with a short business meeting, followed by both a literary and clinical program. Dr. Salsbery gave an exceptionally good paper entitled "Bovine Mastitis." He emphasized the factors pertaining to etiology, tests for the practitioner to use in the field and the final disposition of the case as determined by both physical and simple laboratory examinations, thus presenting a much discussed subject in a fashion that could be used by the practitioner. Various phases of this condition were discussed by the veterinarians associated with dairying and health regulation enforcement. Dr. J. H. Bouton, of Aurora, and Dr. G. G. Miller, of Denver, demonstrated methods of restraining small animals and the use of anesthetic reagents that insure the most desirable results.

The afternoon session was devoted to the clinic. Dr. George H. Carr performed an equine cryptorchic operation, quickly and capably. Surgery of the foot of the bovine was demonstrated

by Dr. Fowler, and enucleation of the eye (bovine) was performed by Dr. M. E. Spratlin, of Littleton. Dr. Spratlin conducts an extensive dairy practice and is well qualified in the field of bovine surgery and medicine.

Peroneal tenotomy (equine) and median neurotomy (equine) were demonstrated by Dr. James Farquharson, of Colorado State College. A thorough discussion of the anatomy, functions and "landmarks," with the use of blackboard diagrams to illustrate each phase, was given prior to the operations. Dr. Farquharson taught anatomy and allied subjects for several years in connection with conducting one of the largest practices in Colorado and this, along with his desire to keep abreast of the times, has placed him with the leaders in the field of veterinary diagnosticians and surgeons. Dr. C. C. Stewart gave an excellent demonstration of intravenous injections in the canine, discussing the indications. He prefers the jugular vein over those frequently used by others. Dr. A. N. Carroll, of Pueblo, demonstrated the reduction and handling of canine fractures. The Dibbell method of reduction and the use of a flexible metal rod for making the cast that can be adjusted so tension can be applied at any desired point were observed with interest. This was followed by a demonstration of the uses for Steinmann pins.

The banquet and dance were held in Ammon's Hall, on the campus, on the evening of the first day, with Dr. R. F. Bourne, of Fort Collins, presiding as toastmaster. The banquet was attended by 180, which represents one of the largest attendances ever recorded by the Association. The after-dinner speakers included Drs. C. E. Salsbery, George R. Fowler, C. A. Lory, E. Sandsten, George H. Glover and Mr. Tom Warren. The concluding talk was given by Dr. I. E. Newsom, Dean, and created considerable interest. Credit for one of the best meetings that the Colorado Veterinary Medical Association has held in many years must go to President Stout and Chairmen Carr and Stewart.

B. R. McCRORY, *Secretary.*

STATE VETERINARY MEDICAL ASSOCIATION OF TEXAS

The twelfth semi-annual meeting of the State Veterinary Medical Association of Texas was held at Texas A. and M. College, June 3-5, 1935, with 65 veterinarians in attendance.

The meeting proper opened on Tuesday morning, and the day was devoted to a literary program with discussions by prominent members of the profession. Dr. Frank Breed, of Lincoln, Neb., read a paper on Bang's disease and its relation to man, a subject that was discussed also by Drs. H. L. Darby and J. J. Reid, of Fort Worth. Lt. Col. George H. Koon, V. C., of Fort Sam Houston, spoke on "The Inspection of Meat, Milk and Food"; Dr. I. B. Boughton, of Sonora, on "Oak Poisoning," and Dr. R. C. Dunn, of the College faculty, on "Anaplasmosis."

A short business session was held on Wednesday morning, at which time Dr. J. K. Northway, of Kingsville, president of the Association, was elected a delegate to the A. V. M. A. convention in Oklahoma City, in August. The program featured Drs. R. C. Dunn and A. A. Lenert, of the College faculty, in a demonstration of taking x-ray pictures. Dr. R. P. Marsteller, also of the faculty, gave a review of tenotomies and neurectomies. Dr. W. M. Smotherman, of Huntsville, gave a demonstration and discussion of the operation for roaring. Dr. P. W. Burns, of the faculty, discussed "Some Antidotes in Veterinary Practice," and Dr. Frank Hecker, of Houston, emphasized the importance of correct diagnosis in the treatment of lameness. The treatment of acute diseases of Thoroughbreds was outlined by Drs. R. L. Rhea, of San Antonio; W. G. Brock, of Dallas; S. S. Severn, of Seguin, and R. T. Dickinson, of Dallas.

Visiting veterinarians and their families were guests at a barbecue, party and dance in the Veterinary Hospital on Tuesday evening. Miss Mary Francis Lenert, of College Station, entertained the guests with a tap dance, and J. Y. Henderson, a senior student in the School of Veterinary Medicine at the College, presented "Cally King," famous high school horse, owned by the College and trained by Mr. Henderson.

Eleven veterinarians were granted licenses to practice in Texas following examinations and a meeting of the State Board of Veterinary Medical Examiners, June 3. All the new licensees are 1935 graduates of Texas A. and M. College.

D. PEARCE, *Secretary.*

HOUSTON VETERINARY ASSOCIATION

The June meeting of the Houston Veterinary Association was held at the Port City Packing Company Restaurant, Houston, Texas, on the 13th. The time of the meeting had been postponed from the 6th to the 13th to accommodate Dr. Charles

Horcher, the honor guest for the occasion, who could not be present on the earlier date. Dr. Horcher, who has been in charge of meat inspection for the U. S. Bureau of Animal Industry at Houston, and who goes to a similar office at New Orleans, La., was unanimously voted an honorary lifetime membership in the Association. The main address was given by Dr. J. Gilbert Horning, who spoke highly of Dr. Horcher and his accomplishments. Other speakers were Dr. A. W. Horstman, who made a report on the meeting of the State Veterinary Medical Association of Texas, which was held at College Station, June 3-5, and Dr. Archie Stallings, president of the Houston Association, who told of the plans of the newly appointed Texas State Board of Veterinary Medical Examiners, of which he is a member.

EASTERN IOWA VETERINARY ASSOCIATION

The Eastern Iowa Veterinary Association held its fifth annual Practitioners' Clinic at the veterinary hospital of Dr. F. M. Wilson, at Mechanicsville, June 18, 1935. In spite of rain, 177 practitioners representing six states were registered. Thirty veterinarians from Illinois, eight from Wisconsin, seven from Minnesota, five from Missouri, four from South Dakota and 123 from Iowa were in attendance. Farmers and other spectators swelled the attendance to an estimated 300.

With the exception of the small-animal cases, which were handled under shelter, the clinic was held outdoors, the horses and cattle being treated in a straw-bedded yard. Demonstrations and operations included: 25 horse cases, five bovine cases, and numerous hog, poultry and pet cases. Three or more major operations were carried on simultaneously during the major part of the day. An operation of special interest was that performed by Dr. L. A. Merillat, of Chicago, Ill., on a roarer.

Dog Sole Heir to Estate

Pet, a white Eskimo dog, was bequeathed the entire $25,000 estate of its 70-year-old mistress, Miss Margaret McDermott, of Chicago, who died on June 4. The will specifies that Pet be placed in the care of some woman who loves dogs and in a "first-class home without children." When Pet dies, the estate is to go to the Anti-Cruelty Society.

Error has no end.—BROWNING.

NECROLOGY

DALE E. SAWYER

Dr. Dale E. Sawyer, of Bainbridge, Ga., died suddenly on December 19, 1934. He had been in ill health for about two years, but was thought to have improved a few weeks prior to his death.

Dr. Sawyer was a graduate of the Kansas City Veterinary College, class of 1903. Following his graduation, he entered general practice, later accepting an appointment in the U. S. Bureau of Animal Industry. He served in various capacities in different sections of the country, not only in the B. A. I., but in state work. In 1917, Dr. Sawyer definitely gave up his profession to enter the Extension Service as County Agent of Cobb County, Georgia, where he remained until 1922. In that year, he became County Agent of Decatur County, Georgia, and served that community until his death. As a county agent, he performed no veterinary services, holding that such services were not within his province. He was an efficient worker and executive, and was especially interested in boys' club work, of which he made an outstanding success.

Dr. Sawyer was a member of Epsilon Sigma Phi, a fraternity of extension workers, and had much to do with the success of the Alpha Beta Chapter in Georgia. He was an earnest church worker, a good neighbor and a fine citizen.

A. G. G. R.

JOHN P. NIEDERAUER

Dr. John P. Niederauer, of Pierre, S. Dak., died in a local hospital, March 19, 1935, after an illness of several weeks.

Born at Tuscola, Ill., February 17, 1866, Dr. Niederauer spent his early years in Illinois. When he was 18 years old, the family moved to South Dakota and homesteaded in Faulk County. The father died during the first year and Dr. Niederauer, as the oldest of seven children, shouldered the responsibility of looking after the family. For a while he engaged in the livery business at Browns Valley, Minn., and later at Graceville, Minn. In 1903,

he decided to study veterinary medicine and matriculated at the McKillip Veterinary College. Following his graduation, in 1907, he returned to South Dakota and began the practice of his profession at Mellette. Here he remained until 1917, when he joined the Division of Animal Industry in the South Dakota Department of Agriculture. After 17 years with the Division, he was given a temporary appointment as inspector with the U. S. B. A. I., in connection with the federal drouth-cattle purchasing program, and held that position for several months prior to his death.

Dr. Niederauer joined the A. V. M. A. in 1922. He was also a member of the South Dakota Veterinary Medical Association. Surviving are his widow, three brothers and two sisters.

G. E. M.

W. F. WEESE

Dr. W. F. Weese, of Ottawa, Ill., died February 13, 1935. He was graduated from the Ontario Veterinary College in 1887, and was the father of Dr. Clark M. Weese (Chi. '03), who died June 3, 1927.

JESSE ROBARDS

Dr. Jesse Robards died at San Antonio, Texas, May 2, 1935. He was born at Vibbard, Mo., October 4, 1870, and studied veterinary medicine at the Chicago Veterinary College. Following his graduation in 1892, Dr. Robards was employed in the U. S. Bureau of Animal Industry. He was stationed at various points in Texas on tick eradication. He joined the A. V. M. A. in 1918.

DOUGLAS ROBERT BROWN

Dr. Douglas R. Brown, of Ennis, Texas, died at Vernon, Texas, May 3, 1935. Pneumonia was the cause of his death. Dr. Brown was a graduate of the Colorado Agricultural College with the class of 1931, and was a member of Zeta Chapter of Alpha Psi Fraternity.

J. G. H.

GILBERT JAMES ROBERTSON

Dr. Gilbert J. Robertson, of Crete, Neb., died in a Lincoln, Neb., hospital, May 4, 1935, at the age of 79 years. He was a graduate of the Ontario Veterinary College, class of 1889. He

first located for practice at Beatrice, Neb., but for the past twelve years had been located at Crete. He is survived by his widow, a daughter and two sons, one of whom is Dr. E. W. Robertson (Chi. '14), of Careyhurst, Wyo.

GEORGE ARTHUR DODGE

Dr. George A. Dodge, of Northwood, Iowa, died at his home on May 27, 1935, after an illness of several months. He was 60 years of age.

Born at Newburg, Iowa, Dr. Dodge attended public school at Saint Ansgar, Iowa, and later attended Iowa State College and the University of Pennsylvania. He received his degree in veterinary medicine from the latter institution in 1904 and immediately began practice at Northwood. Dr. Dodge joined the A. V. M. A. in 1907. He was active in civic affairs and in Masonic circles. Surviving are his widow, three children, his father, two brothers and four sisters.

C. D. L.

E. J. GIGER

Dr. E. J. Giger, of Marine, Ill., died at his home, May 28, 1935, after an illness of three years. He had been bedfast for the past 18 months.

Born on a farm near Saint Jacob, February 28, 1869, Dr. Giger attended local schools. Later he attended three sessions at the Chicago Veterinary College (1902-1905), but his name does not appear as a graduate of the institution. He was licensed "by examination" to practice in Illinois. He is survived by his widow, a daughter, two sisters and two brothers.

J. W. HARKIN

Dr. J. W. Harkin, of Shullsburg, Wis., died in a hospital at Elgin, Ill., June 4, 1935. Death was believed to be due to peritonitis. Dr. Harkin was on his way back to Shullsburg after spending Memorial Day in Chicago, when he was taken ill and rushed to the hospital. He was 52 years old. Dr. Harkin was a graduate of the Chicago Veterinary College, with the class of 1914. He had served as mayor of Shullsburg. On April 1 of this year he received the appointment of postmaster and held that office at the time of his death.

CHARLES ELDER SHAVER

Dr. Charles E. Shaver, of Ridgway, Ill., died at his home on June 6, 1935, following a paralytic stroke which he had suffered the previous day. He was about 60 years old. A graduate of the Chicago Veterinary College, class of 1914, Dr. Shaver was widely known throughout Saline and Gallatin counties as an able veterinarian. He is survived by his widow, one son and three daughters.

LEVI L. MILLER

Dr. Levi L. Miller, of Caledonia, Mich., died at his home, June 12, 1935. Born on a farm near Caledonia, October 30, 1886, he was graduated from the Grand Rapids Veterinary College with the class of 1914. Following his graduation, he returned to Caledonia where he had since practiced. Dr. Miller was well known, not only in his profession but as an enthusiastic fisherman and hunter. He joined the A. V. M. A. in 1917. He was a member of the Michigan State Veterinary Medical Association. Surviving are his widow (née Josie Heip) and one daughter.

EDWARD B. CARTER

Dr. E. B. Carter, of Austin, Minn., died at Saint Olaf Hospital, June 15, 1935. Pneumonia was the immediate cause of death, this having followed a relatively short illness diagnosed as uremic poisoning.

Born near Austin, December 25, 1880, Dr. Carter attended local schools and the Minnesota School of Agriculture. Deciding on the study of veterinary medicine, he matriculated at the Chicago Veterinary College and was graduated in 1912. Following his graduation, he began the practice of his profession at Grand Meadow, Minn. Later, he removed to Austin where he developed a fine practice, and became actively interested in municipal affairs. He served two terms as alderman of Austin, and in 1928 was elected mayor, an office he held for a term. For a number of years, he served the city as milk inspector.

Dr. Carter joined the A. V. M. A. in 1915, and served as resident secretary for Minnesota for two years (1919-21). He was a member of the Twelfth International Veterinary Congress, a former president of the Minnesota State Veterinary Medical Society and a member of Alpha Psi Fraternity. He is survived by one sister. H. C. H. K.

WILLIAM LESTER HOLLISTER

Dr. W. Lester Hollister, of Avon, Ill., died in the Saunders Hospital, June 20, 1935, following a brief illness with pneumonia.

Born near Avon, March 7, 1879, Dr. Hollister received his early education in local grade schools and in the Avon High School. His graduation from high school with the class of 1898 was cut short by his enlistment in the Spanish-American War. He saw active service in Puerto Rico with Company D, Regiment 16, and was mustered out of service in October of the same year. He entered the Chicago Veterinary College for the study of veterinary medicine. Following his graduation from the College, in 1910, he became an assistant to Dr. C. M. Weese (Chi. '03), at Aurora, Ill. In 1912, he returned to Avon, where he established a very large practice and devoted special attention to diseases of swine. He was associated with various business enterprises in and around Avon.

Dr. Hollister was a second lieutenant in the Veterinary Corps during the World War. He was commissioned on October 12, 1918, and directed to report to the Veterinary Training School at Camp Lee, Va. He was discharged on December 5, 1918. He gave up private practice about two years ago to accept a position with the Illinois Department of Agriculture and had been stationed at the Peoria (Ill.) Stock Yards. He had served two consecutive terms as mayor of Avon, his last term expiring about eight years ago. At the time of his death, he was a member of the Fulton County Democratic Central Committee.

Dr. Hollister joined the A. V. M. A. in 1915. He was a member and past-president of the Illinois State Veterinary Medical Association, and a member of Alpha Psi Fraternity. He was a Mason. Surviving are his widow (née Lucretia Merrill) and one sister.

LEO J. McLAREN

Dr. Leo J. McLaren, of Joliet, Ill., died at his home on June 23, 1935, following an illness of a week with a heart ailment. He was 50 years old. Born in Clinton, Iowa, he was brought by his parents to Joliet when he was two years old. He attended local grade and high schools and entered the Chicago Veterinary College, receiving his degree in 1909. He established a practice in Joliet and was appointed an assistant state veterinarian in 1913, a position that he held until the time of his death. Surviving Dr. McLaren are his widow, two sons, and one brother.

JOHN F. RYAN

Dr. John F. Ryan, of Riverside, Ill., died at his home, June 27, 1935.

Born in Montreal, Canada, March 14, 1848, Dr. Ryan attended the Montreal Veterinary College and was graduated in 1877. Later, when the College became a part of McGill University, all graduates of the College who had been practicing their profession ethically were eligible to receive the degree of Doctor of Veterinary Science from McGill. Dr. Ryan qualified and, in 1891, was granted his degree. He became a member of the original faculty of the Chicago Veterinary College at the time of its organization in 1883. He occupied the chair of professor of parasitology, at the same time conducting a large general practice in Chicago. When he severed his connection with the College, in 1914, he left Chicago and located in La Grange, Ill., where he continued to practice for a few years. Later he removed to Riverside, where he resided until his death. He served Illinois as assistant state veterinarian for eight years.

Dr. Ryan joined the A. V. M. A. in 1891. He had served as president of the Illinois State Veterinary Medical Association, and was an active member of the Chicago Veterinary Medical Association for many years.

Our sympathy goes out to Dr. R. W. Gannett, of Brooklyn, N. Y., in the death of his wife, June 12, 1935, after a brief illness.

PERSONALS

MARRIAGES

Dr. Henry E. Moskey (U. P. '20), of Washington, D. C., to Miss Lois Louise Pollard, of Huntington, W. Va., at Huntington, May 6, 1935.

Dr. Robert J. Schermerhorn (San Fran. '14), of Redlands, Calif., to Miss Pauline Barbara Shea, of Santa Barbara, Calif., at Santa Barbara, June 3, 1935.

Dr. Sheldon W. Stout (O. S. U. '35), of Hamilton, Ohio, to Miss Esther Bogart, of Harrison, Ohio, June 15, 1935, at Harrison.

Dr. Andrew J. McKee (K. S. C. '23), of Houston, Texas, to Miss Pauline Brooks, of Joshua, Texas, June 18, 1935, at Cleburne, Texas.

PERSONALS

Dr. J. C. Kaiser (Iowa '35) has located at Rockwell, Iowa, for practice.

Dr. Oscar O. Mosby (Iowa '35) has selected Northwood, Iowa, as a location for general practice.

DR. H. H. GROTH (O. S. U. '26), of San Mateo, Calif., recently took a pleasure trip to Honolulu.

DR. J. R. HARRISON (Ont. '08), formerly of Gary, Ind., has located at Van Buren, Ind., for general practice.

DR. G. W. MACKIE (Ont. '98), of San Antonio, Texas, is now in Mexico, representing the Cutter Laboratories.

DR. H. W. JACOBSON (Wash. '35) has accepted a position with the Montana Livestock Sanitary Board, at Helena.

DR. F. E. CASWELL (Ont. '13), of North Adams, Mich., has opened a hospital for small animals, on West Main Street.

DR. LLOYD E. CASEY (Colo. '22), of Dallas, Texas, has been appointed track veterinarian for the Dallas Fair Park track.

DR. R. L. BRINKMAN (Cin. '17) has been elected president of the Rotary Club of Live Oak, Fla., for the year 1935-36.

DR. SHELDON W. STOUT (O. S. U. '35), of Harrison, Ohio, has taken over the practice of the late Dr. S. W. Brown, at Hamilton, Ohio.

DR. E. E. SLATTER (O. S. U. '30), formerly of Saint Joseph, Ill., has located in Sidney, Ill., which is nearer the center of his practice.

DR. REX TAYLOR (Wash. '30), formerly associated with Dr. H. H. Groth (O. S. U. '26), of San Mateo, Calif., is now practicing at San Jose, Calif.

DR. F. C. STEINMAN (Tex. '29), of Clarksville, Texas, has been appointed a veterinary inspector by the Texas State Live Stock Sanitary Commission.

DR. GEORGE W. HESS (T. H. '18), of West McHenry, Ill., has been reappointed McHenry County Veterinarian by the Board of County Supervisors.

DR. RUSSELL E. HALSTEAD (O. S. U. '32), formerly associated with Dr. C. A. Pleuger (O. S. U. '22), at Cincinnati, Ohio, has started practicing at Waynesville, Ohio.

DR. FRED E. GRAVES (Chi. '16), of Belvidere, Ill., has been reappointed Boone County (Ill.) Veterinarian for a term of two years, by the Board of Supervisors.

DR. SAM BUNTON, JR. (Tex. '33), of Del Rio, Texas, recently became a member of the veterinary inspection staff of the Texas State Live Stock Sanitary Commission.

DR. HARRY CALDWELL (Chi. '05), of Wheaton, Ill., was official veterinarian to the *Chicago Tribune* Horse and Mule Pulling Contest, held near Wheaton on June 15.

DR. J. C. MCGRATH (San Fran. '15), of Phoenix, Ariz., has accepted appointment to active duty in the Veterinary Reserve Corps and has been ordered to report for duty at Fort Logan, Colo.

DR. S. C. SORENSON (St. Jos. '13), of Tescott, Kan., has accepted a temporary appointment with the U. S. Bureau of Animal Industry and is now stationed at Sells, Ariz., on tuberculosis eradication.

DR. W. W. DIMOCK (Corn. '05), of Lexington, Ky., accompanied by Mrs. Dimock, will sail from New York on July 26 for a trip to Europe. They plan to return to Lexington about the middle of September.

DR. A. J. PISTOR (Amer. '98), Chief of the Meat Inspection Division of the U. S. Bureau of Animal Industry, is a member of the Board of Directors of the U. S. Department of Agriculture Beneficial and Relief Association.

DR. GEORGE C. MOODY (Ont. '85), of Mason, Mich., celebrated his 91st birthday on June 18, 1935. This spring marked the fiftieth anniversary of his entry into general practice at Mason. For a number of years, Dr. Moody served as Ingham County Veterinarian.

DR. FRED M. BURKEY (Tex. '31), who has been holding a temporary appointment with the U. S. Bureau of Animal Industry, recently resigned to enter active duty in the Veterinary Reserve Corps as district veterinarian for the CCC in the Eighth Corps Area.

DR. A. H. CRAIGE (U. P. '32), of the Department of Veterinary Physiology, University of Pennsylvania, took part in the program of the Congress of Anesthetists, at Atlantic City, N. J., June 10, 1935. His report was entitled, "Observations on the Depressant Action of Bulbocapnine."

DR. R. A. RUNNELLS (Mich. '16), of the Veterinary Pathology Department, Iowa State College, accompanied by Mrs. Runnells, is spending the summer in Germany, and will visit various veterinary institutions in that country. He will also attend the summer course at one of these institutions.

DR. A. REGINALD GLAISYER (Iowa '99), of Kalaheo, Kauai, Hawaii, spent several days visiting friends in Chicago during the early part of June on his way to Washington, D. C. for the annual conclave of the Shriners. Dr. Glaisyer expects to be able to attend the A. V. M. A. convention in Oklahoma City next month.

DR. JOHN D. BECK (U. P. '28), assistant professor of veterinary surgery, University of Pennsylvania, is expected to return from Germany about August 1. He has been studying for the past year at various veterinary and medical centers abroad, spending several months each at Edinburgh, Scotland, and Munich, Germany.

DR. LLOYD D. JONES (Iowa '31), of Rochelle, Ill., who has been a member of the North Shore Animal Hospital, Evanston, Ill., for the past two years, has resigned to enter active duty in the Veterinary Reserve Corps as district veterinarian. He has been assigned to duty at the CCC Camp at Fort Brady, Saulte Sainte Marie, Mich.

DR. HOWARD C. GALE (K. C. V. C. '10), of Fort Worth, Texas, captain in the Veterinary Reserve Corps, recently accepted appointment to active duty as district veterinarian in the CCC. He reported to Col. George H. Koon, Corps Area Veterinarian, Fort Sam Houston, Texas, for temporary duty for two weeks prior to being assigned to a CCC district.

DR. E. P. JOHNSON (Mich. '25), assistant in animal pathology, Department of Biology, Virginia Polytechnic Institute, was granted the degree, Doctor of Philosophy, at the commencement exercises of the University of Virginia, on June 11, 1935. Dr. Johnson's thesis, "The Etiology and Histogenesis of Leucosis and Lymphomatosis of Fowls," is available at the Virginia Experiment Station as Technical Bulletin No. 56.

DR. J. J. REID (Tex. '21), of Fort Worth, Texas, who has been connected with the laboratory of the Texas Live Stock Sanitary Commission, has resigned to accept active duty with the Veterinary Reserve Corps as district veterinarian in connection with CCC meat-food inspection. Capt. Reid reported to Col. George H. Koon, Corps Area Veterinarian, Fort Sam Houston, Texas, for preliminary instruction prior to being assigned to a CCC district.

DR. D. M. SWINEHART (O. S. U. '10), of Elida, Ohio, accompanied by Mrs. Swinehart, left for an extended motor trip through the West, June 29. Their itinerary included Omaha, Yellowstone Park, Butte, Spokane, Portland, San Francisco, Yosemite Park, Los Angeles, San Diego, the Grand Canyon, Albuquerque, Pike's Peak, Denver, and other places too numerous to mention. They expect to return home the latter part of August.